Smartcom II° User's Guide

For the IBM® PC, IBM XT and Compatibles

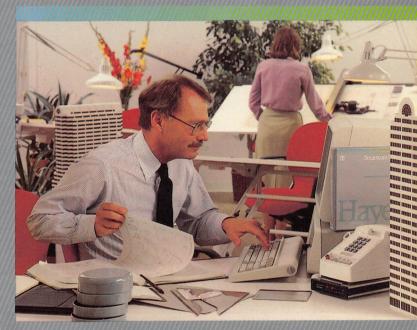


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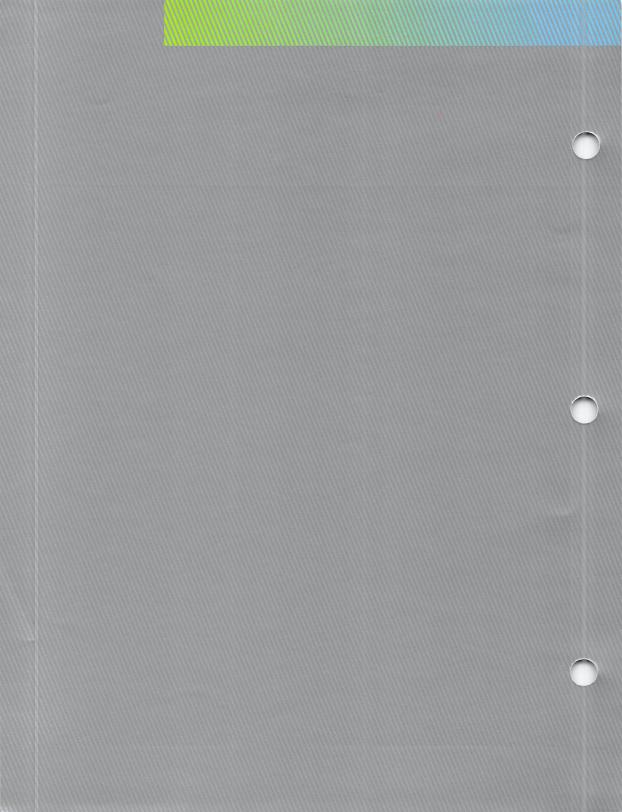
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1 Introduction

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Introduction

Smartcom II makes it easy to communicate with other computers. This manual is structured to help you get started in short order. By the time you get to the end of chapter 3. you will be communicating with an information service. From that point on you can proceed a chapter at a time to other communication procedures which best serve your needs.

What can Smartcom II do for you?

Smartcom II manages remote communication for selected microcomputers equipped with the Hayes Smartmodem 300, Smartmodem 1200, or Smartmodem 1200B.

This version of Smartcom II is designed for the IBM Personal Computer equipped with a minimum of 192K bytes of memory (128K bytes available for program) and the IBM Disk Operating System.

This version of Smartcom II also runs on other Smartcom II compatible computers. For a current list of compatible computers, contact Hayes Microcomputer Products, Inc. Customer Service department at (404) 441-1617. Additional versions of Smartcom II are available for other popular personal computers.

Smartcom II makes communication easy and efficient by performing the following:

- Establishes and answers computer calls
- Creates and displays files
- Sends and receives files
- Sets up data sessions with unattended remote systems
- Sends data to your printer
- Manages your communication parameters
- Provides protocol for error-free remote access file transfer procedures
- Stores batch commands (up to 500 keystrokes) for automatic communication sessions at a specified time
- Emulates VT52 and VT102/VT100
- Provides Macro data string protection (security)

- Allows color monitor or monochrome monitor and adapter selection
- Automatically sorts file directory entries
- Facilitates file name selection via cursor controls
- Allows easy transfer between voice and data communications.

Please note that Smartcom II takes control of the computer, therefore no background tasks can be run in conjunction with Smartcom II.

Organization of the Manual

The Owner's Manual is designed to help you learn about and use Smartcom II. Once you are familiar with Smartcom II procedures. you may only need to refer to the Help Screens in Smartcom II for details.

Chapter 1 Introduction acquaints you with the capabilities of Smartcom II and describes the special considerations for the IBM Computer and for Smartcom II compatible computers. This chapter also describes the hardware and software required for operating Smartcom with your computer.

Chapter 2 Installation first provides supplementary instructions to the Smartmodem Hardware Reference Manual for setting up and checking your Smartmodem. Next, the instructions take you through Smartcom II installation and preparation (including copying of the disk), starting up Smartcom II, and checking pertinent system parameters and printer protocol.

Chapter 3 Getting Started helps you to become familiar with the main menu screen and the various subordinate screens. At the end of this chapter, you are guided step by step through the process for contacting an information service.

Chapter 4 Working With Communication Sets helps you to create an individual communications environment, for each remote system that you call, by selecting settings for basic operating parameters, defining macro instructions, and recording communication command sequences.

Chapter 5 File Management focuses on the commands that manage your files and on concepts related to transferring text files from your system to a remote system and vice versa.

Chapter 6 Communicating With Computers assists you with selecting file transfer protocols, establishing connections between two microcomputers, transferring files between microcomputers, and using the Remote Access feature. Instructions for turning on compressed printing and for using terminal emulation are provided at the end of the chapter.

Chapter 7 Troubleshooting helps you to recognize the cause of a communications problem and to correct it. It describes how you may "fine tune" parameters and configuration values through Smartcom II to develop efficient communication. Smartcom II error messages are explained following the troubleshooting tables.

Chapter 8 Communications Primer introduces some basic concepts of data communications that relate to Smartmodems and Smartcom II.

Chapter 9 Networks and Information Services provides general information about national data networks and information services, a telephone number for contacting each, and how Smartcom II may be used with each. Forms are furnished for keeping notes on accounts.

Glossary. Technical terms relating to Smartcom II and modems are defined in the Glossary.

Index. Keyword **Index** is arranged alphabetically by subject matter.

User Support Information contains documentation concerning Copyright Restrictions, Warranty Information, and Diskette Replacement Policy.

Conventions of the Manual

Throughout the manual, certain conventions and abbreviations distinguish program features and special actions. These include the following: All menu selections and all secondary commands, stemming from the selection of a menu option, appear in all capital letters. All of the items on the Parameters, Configuration, and Macro Definition screens are indicated in bold type. Every item so indicated has a variable setting or value.

The abbreviation "CTRL" designates the control key. "CTRL-X," where X is another key, indicates that the control key and the other key are pressed simultaneously to produce a special control code.

All references to MS-DOS refer to the version of MS-DOS supplied with the Smartcom II compatible computers.

It is assumed that you are familiar with the IBM Personal Computer including its keyboard, DOS and the correct treatment of floppy disks. You may need additional information about certain hardware components when installing Smartcom II. As necessary, refer to the appropriate manuals provided with this equipment. Also, keep available documentation about the remote computer system nearby to assist you in entering parameter values.

Use this manual while seated at your computer; install your hardware; install the program; and explore the capabilities of Smartcom II for remote communication and data transfer. Whenever you want an explanation of a menu option, screen entry, or choice of responses, just press the Help Key. The Smartcom II program contains a wealth of rapidly accessible help screens. To return to the menu, just press the Escape Key (F1 unless redefined).

Special Considerations for the IBM Personal Computer

Hardware/ Software Requirements

Smartcom II requires the equipment (hardware) and software described in the following tables.

Requirements

Item	Notes
Hardware	
IBM Personal Computer	Includes system unit, keyboard, 80-column monitor, and disk drive.
One 5-1/4 inch floppy disk drive for double-sided, double density disks.	
128K bytes of available memory	If available. Smartcom II uses up to 256K bytes of RAM. The program consists of several software modules. The master module stores as many modules as it can in the available memory. If most of the program is stored in memory. operations occur more quickly than when the program must retrieve additional modules from the Smartcom II disk.
Freestanding or board-level Smartmodem	
IBM Asynchronous Communication Adapter (required with freestanding modem only).	An equivalent asynchronous communication adapter may be used.
One cable with DB-25 male to female connectors (required with freestanding modem only).	At a minimum, the cable must connect pins 2.3, 7.8 and 20.

Item

Notes

Software

IBM Disk Operating System (DOS) 1.00, 1.10, 2.00, or 2.10

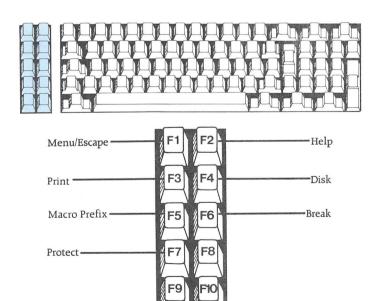
After DOS is loaded, a minimum of 128K bytes of RAM must be available for Smartcom II. You may check your available memory space by executing the DOS "CHKDSK" program.

Optional Hardware

Serial or parallel printer with appropriate cable

Special Keys Supported by Smartcom II

The keyboard for the IBM Personal Computer includes special keys for controlling the screen display and other function keys. Smartcom II accepts all ASCII characters generated from the keyboard plus the special keys and key combinations listed below. Use the keys which are assigned Smartcom II default values to perform the special program commands indicated in the following table.



Function Key	Smartcom II Term	Decima Value	l Smartcom II Default Value	
F1 F2 F3 F4 F5 F6 F7 F8 F9	F1 F2 F3 F4 F5 F6 F7 F8 F9	128 129 130 131 132 133 134 135 136 137	Menu/Escape Help Print Disk Macro Prefix Break Protect	
Shift-F1	SHIFT-F1	138		
Shift-F10 Ctrl-F1	SHIFT-F10 CTRL-F1	147 148		
Ctrl-F10	CTRL-F10	157		
Alt-F1	ALT-F1	158		
Alt-F10	ALT-F10	167		
Ctrl-PrtSc Ctrl-Brk Up Arrow	CTRL-PRT CTRL-BRK UP	168 169 170		These keys
Left Arrow Right Arrow Down Arrow Pg Up Pg Dn Home	PG UP PG DOWN HOME	176	Page Up Page Down Top Of Buffer	perform special functions when on-line with another compu- ter. See Buffer Recall Keys
End Ins Alt-A	INS ALT-A	177 178 179	Bottom Of Buffer	description in this chapter for details.
Alt-Z	ALT-Z	204		

To facilitate use of the various special keys, pertinent key definitions are provided on the screens. For example, the following definitions are shown during on-line communications.

Standard Values

Menu: F1 Print: F3 Disk: F4 Macro: F5 Break: F6 2:18 pm Tuesday April 10, 1984

The procedure for changing the special function key definitions is discussed in the *Parameters* section of Chapter 4.

Note: While running Smartcom II, only the following DOS functions are available: **NUM LOCK**, **CAPS LOCK**, **PRT SC** and **CRTL-ALT-DEL**.

The Menu/Escape Key: F1 One of the most frequently used keys is F1. Key F1 is automatically assigned by Smartcom to the Menu/Escape function. When on-line with another computer system, pressing F1 allows you to switch to Smartcom menu functions. To get back to on-line operations, just press F1 again. That is why this key is called the Escape key or Menu key in the manual.

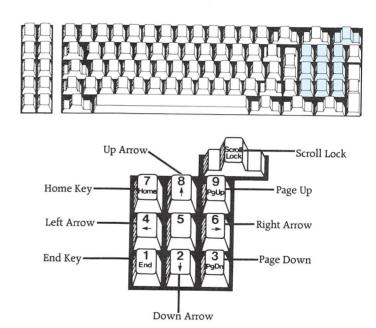
Note: Pressing the key labeled "Esc" will only recall the Smartcom menu screen when **not** on-line with another computer.

Buffer Recall Keys

Smartcom II allocates space in memory for temporarily storing or buffering incoming data as it is routed to the terminal, disk drives, and the printer. When you use the IBM Personal Computer. Smartcom II maintains a large buffer. This buffer can be approximately 30 to 40 pages long or 4000 bytes, although the exact size depends on the amount of available memory.

Therefore, you may be able to capture a large file onto disk without losing data even if the system sending the file does not support the Stop/Start protocol. When you print at the same time or use the Page Pause feature, the printer or console can lose data if the remote system does not support Smartcom II's protocols. However, the complete file is captured on disk.

An extremely useful program feature lets you recall the data from this buffer and scroll through it. You can look at the information in the buffer while at the same time Smartcom II continues to receive new data. Seven of Smartcom II's special function keys can be used to control buffer recall. These keys are illustrated and described as follows:



Display Buffer Control Keys for the IBM PC

Smartcom II Action (See Note)
Shows the first 22 lines of text in the display buffer.
Scrolls backward 20 lines.
Scrolls forward 20 lines.
Scrolls the screen up 1 line.
Scrolls the screen down 1 line.
Resumes display of incoming data from the Smartmodem.
Freezes the display. Press the space bar to display the next page, or use the scrolling keys.

Notes:

- These keys will not perform their buffer recall functions while you are sending a file or executing a Macro.
- The buffer recall keys work independently of the Page Pause feature. When the parameter Page Pause is set to YES, the program automatically performs a Scroll Lock after 20 lines of text have been displayed. Pressing any key, except those described in this section, causes the next 20 lines of text to be displayed.
- The program keeps data in the display buffer even after you disconnect from the remote system. Pressing the Escape Key (F1 unless redefined) returns you to the on-line screen. You cannot record to disk or print any of the data in the display buffer: however, you can use the PrtSc Key to print what is currently on the screen.

Display Buffer Management

Smartcom II uses a wrap-around buffer concept to control the display process. As the display buffer fills, it replaces "old" data with new data. When this new data approaches the point of overwriting what you are currently viewing, a **Stop Character** is sent to the remote system. After you have scrolled forward through the text, a **Start Character** is sent to the remote system to continue its data transmission. If you press **Home** after receiving a large amount of text, you may discover that some portion of data is no longer available for viewing because it has been overwritten by new incoming data.

Designating A Filename

When prompted to Enter File, you may press the arrow keys to select a file listed in the directory. Press the Up, Down, Left, and Right Arrow keys until the file you want is highlighted, then press — You may use the PgUp and PgDn keys to scroll eight lines at a time. In addition, the Home and End keys let you select the first or last file listed in the directory.

Key Equivalencies for VT102/VT100 and VT52 Emulators

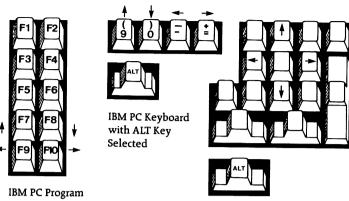
When your terminal is set to emulate a VT100, VT102, or VT52. the keys take on different functions than those already described for Smartcom II operations.

The following tables detail special IBM PC keyboard equivalencies when you use the VT100 series emulators:

VT102/VT100 Key	Equivalent IBM PC Key
	IBIVITE RES
ESC	ESC
TAB	> I
BACK SPACE	CTRL ← or CTRL-H
BREAK	Smartcom II defined
RETURN	← J
DELETE	←
LINE FEED	CTRL-J or CTRL-L ←
PF1	F1
PF2	F2
PF3	F3
PF4	F4
Up Arrow	F7*
Down Arrow	F8*
Left Arrow	F9*
Right Arrow	F10*

^{*} Note: The VT102/VT100 keyboard right, left, up, and down key functions are also simulated by two other key groupings on the IBM PC as shown in the following figure:

VT102/VT100/VT52 Equivalent Arrow Functions

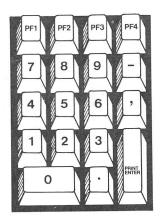


IBM PC Program Function Keys

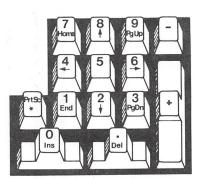
IBM PC Keypad with ALT Key Selected

VT102/VT100 Numeric Keypad	Equivalent IBM Keypad (Not in Num Lock Mode)
0	0
1-9	1-9
. (period)	(period)
, (comma)	Prt Sc
– (minus sign)	– (far right side)
PRINT ENTER	+ (far right side)

VT100 Numeric Keypad



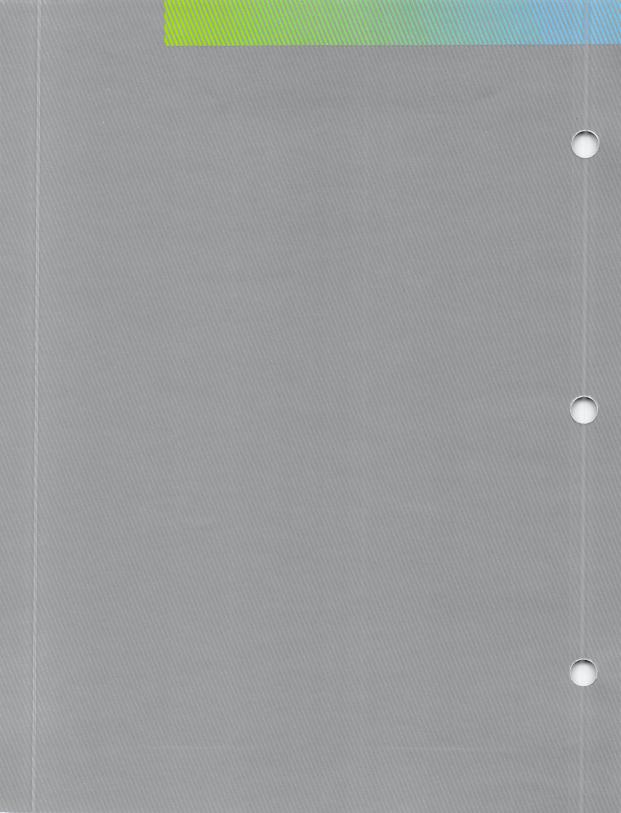
IBM PC Keypad (Not in Num Lock Mode)



Note: The defined Switch Key for toggling between Smartcom II and the VT100 series emulators is the **Scroll Lock Key**.

2 Installation

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Chapter Objectives

This chapter helps you to install the Smartcom program by presenting the software and hardware considerations related to installation. The sequence of steps is:

- Install your Smartmodem and set the configuration switches.
- Load and copy the Smartcom disk.
- Set the Smartcom parameters to match your system configuration.

Smartmodem Installation

To install the Smartmodem. refer to the hardware manual provided with the product. Check that your package is complete and undamaged. Read the restrictions of the Federal Communications Commission included in the manual and notify the telephone company of your modem. Be sure that power to all equipment is turned off and then follow the installation instructions in the hardware manual. If you have not already done so, check the Hardware/Software requirements for your computer in Chapter 1.

Some Smartcom II compatible personal computers may not accommodate the Smartmodem 1200B because they already contain the maximum number of communication ports in their configuration. In those instances, the Hayes freestanding Smartmodem should be used.

The RS-232C port on the rear of the freestanding Smartmodem connects to the IBM Personal Computer's Asynchronous Communications Adapter via a cable with male and female DB-25 connectors. The cable should be wired to connect pins 2, 3, 7, 8, and 20 (Transmit Data, Receive Data, Signal Ground, Carrier Detect, and Data Terminal Ready) on the male DB-25 connector to the same pin numbers on the female DB-25 connector.

Smartmodem 300 and Smartmodem 1200 Configuration Switches The factory settings of the configuration switches are compatible with Smartcom II. However, some of the alternate settings may provide additional control.

Check the settings of the Smartmodem configuration switches 7 and 8 which are located behind the modem's front panel. Be certain switch 7 suits your environment (UP for a single line telephone connection, DOWN for a multiline installation). If you have a Smartmodem 1200, switch 8 must be in the DOWN position: otherwise, the modem will not recognize any Smartcom II commands. Set switch 1 UP if your modem cable supports DTR and DOWN if not (see figures below). Smartcom II automatically sets the remaining switches (2-5), ignoring the current settings. To reach these switches, remove the modem's front end cap as instructed in the Smartmodem hardware reference manual.

Smartmodem 300 and 1200 Configuration Switches



Configuration switches for single jack phone; modem cable does not support DTR



Configuration switches for single jack phone; modem cable supports DTR and Carrier Detect.



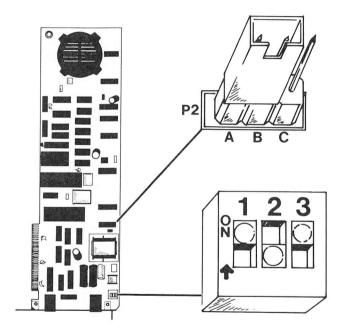
Configuration switches for single jack phone: modem cable supports Carrier Detect but not DTR.

Smartmodem 1200B Configuration Switches

Three configuration switches and a DTR jumper on the Smartmodem 1200B establish certain operating conditions. These are initially set at the factory to accommodate the most typical operating conditions. The factory setting of Switch 1 designates Smartmodem 1200B as the IBM Personal Computer COM1 device. Similarly, the factory setting of Switch 2 sets up Smartmodem 1200B for single telephone line operation. Smartcom II users need not be concerned with the setting of Switch 3 nor with the position of the DTR jumper.

Position the board as shown in the illustration and locate the switches and jumper. Verify that the switches and jumper are set as shown.

Smartmodem 1200B



You do not need to change these settings unless:

1. you have installed another serial device, other than the modem, to COM1 (such as a serial port for a printer). In this case, set the Smartmodem 1200B to COM2 by setting Switch 1 to OFF.

Note: The Communications Port value must also be changed from its default value of COM1 to COM2; see System Configuration instructions. Do not set the Smartmodem 1200B to COM2 unless COM1 is already occupied by another device.

- 2. you have two serial ports in your system, as might be the case with a multi-function/RAM card. In this case, one port should be disabled to accommodate the Smartmodem 1200B.
- 3. you are connecting the modem to a telephone jack for a multiline connection (RJ12 or RJ13). In this case, set switch S2 to ON.
- 4. your software is not communicating with the Smartmodem 1200B. In this case, change the DTR jumper to the alternate setting.

If any of these conditions apply, refer to the Configuration Switches description in the Smartmodem 1200B Hardware Reference Manual for further details.

Smartcom II Installation

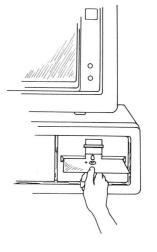
Smartcom II Preparation with a Dual Disk-drive system Over time, unexplained errors may develop on a frequently used disk. Guard against the loss of your investment by creating two copies of the Smartcom II disk. Use one disk as a daily working copy of the program and the other as a backup copy. Store the backup disk in a safe place so that a copy of the program is readily available should the working disk become damaged. Follow these steps to prepare the copies.

Note: The procedure for copying the Smartcom II disk with a single disk-drive system uses the same copy command. Swap the disks when prompted to do so.

Step Procedure Notes

1. Insert your DOS working disk into drive A. reset the computer and enter the date and time.

2. Insert a blank disk in drive B.



3. Format the disk in drive B by typing: FORMAT B:/S

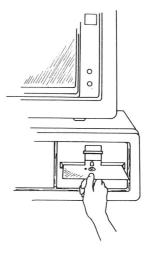
/S transfers the operating system files to the disk after formatting.

FORMAT B:/S

4. After the disk is formatted, you will be asked if you want to format another disk. Press Y.



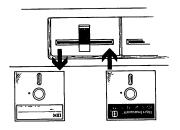
5. Insert another blank disk in drive B and press any key to format it.



6. Type **N** to exit the format program.



7. Remove your MS-DOS disk from drive A and replace with the Smartcom II master disk.

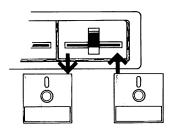


8. Copy the Smartcom II program to the disk in drive B by typing: COPY A:*.* B:

This will copy all of the Smartcom II files to the disk in drive B.



9. After copying is completed, replace the disk in drive B with the other newly formatted disk.



10. Repeat step 8 to make a second copy of Smartcom II.



11. Label one disk Smartcom II-Working and the other, Smartcom II-Backup. Each of these disks contain both the operating system and the Smartcom II program.





12. In a safe location, store both the backup disk and the original Smartcom II disk. Use the disk labeled "Working" for everyday use.

Smartcom II Preparation with a Fixed-disk System

Follow these instructions if your system has a floppy disk drive and a fixed-disk drive. These instructions designate the floppy drive as **A** and the fixed drive as **C**. If your fixed-disk system is set up differently, adjust the instructions to match your configuration.

Step	Procedure	Notes
 Set up your fixed disk according to the manufacturer's instructions. Insert the Smartcom II disk into floppy drive A. 		
		This will copy all of the Smartcor
3. Type	: Copy A:*.* C:	II files to fixed disk drive C in the
	ove the Smartcom II disk drive A and store in a safe	currently selected directory.

Smartcom II Files

The program files are named:

SCOM.CRT SCOM.EXE SCOM.CMD SCOM.OVR SCOM.HLP SCOM.DAT SCOMFIX.EXE SCOMFIX.CMD

SCOM.EXE and SCOM.CMD must reside on the same disk. The other six files may be copied to another disk. The file SCOM.DAT contains the recorded settings for the Configuration Screen.

Parameters Screens. Macro Definition Screens, and Batch Set commands. Moving SCOM.DAT to another disk allows you to fill the data file to its capacity. If the file remains on the Smartcom II disk and you attempt to define all the parameters and macros for every Communication Set, you may exceed the amount of disk space available for this data.

If you store the data file on an alternate disk, instruct Smartcom II to look on the other disk for the files it does not find on the main program disk. If, for example, you have inserted the disk with the SCOM. EXE and SCOM. CMD files in default drive A and inserted the disk with the remaining files in drive B, type SCOM B to start the program.

Caution: Do not delete from the Smartcom II disk any file whose name begins with SCOM.

Starting Up Smartcom II with a Dual-drive System

Step Procedure

- 1. Turn on the freestanding Smartmodem by placing the power switch in the UP position. **Note:** The board level Smartmodem obtains its power when you turn on the computer.
- Insert the Smartcom II disk containing the operating system files in disk drive A.
- 3. Turn on power to your computer.
- 4. Enter the date and time when prompted by the system.
- 5. When the operating system prompt **A** > appears, type **SCOM** and press the return key.
- The computer loads the Smartcom II program and issues a reset command to the Smartmodem.
- If Smartcom II is able to reset the Smartmodem, the Smartcom II main menu is displayed.

Step

Procedure

```
Smartcom II Hayes Microcomputer Products, Inc.

1. Begin Communication *. Receive File 7. Change Printer Status (OFF)
2. Edit Set *. Send File *. Select Remote Access (OFF)
3. Select File Command 6. Change Configuration 9. Display Disk Directory (OFF)
A,B - Change Drive Press F2 For Help
Enter Selection: 1

Dials or answers phone with Smartmodem

Tuesday May 8, 1984
```

This completes the start-up procedure. If Smartcom II displays the following advisory screen, continue with Step 8.

```
Smartcom II

Copyright 1983,1984 Hayes Microcomputer Products, Inc.

IBM PC V2.0[_____]

Stand By...

Smartmodem Not Responding on COM1: Press F1 To Continue
10:20 Tuesday September 4, 1984
```

Step Procedure

- 8. The advisory message: Smartmodem Not Responding on COM1: means either:
 - a. The power switch on the rear of the freestanding Smartmodem is OFF. Verify that the switch is On (up).
 - b. The modem cable is not connected. Verify that the cable is properly connected to the modem and computer (freestanding modems only).
 - c. Your modem is set to COM2 because you have a serial device set to COM1. To change Smartcom II to COM2:
 - Press F1 to display main menu.
 - Select menu option 6. CHANGE CONFIGURATION.
 - Press the Down Arrow key until the cursor reaches the Communications Port line. (If you went too far, back up with the Up Arrow key.)
 - Press the Left Arrow key once to change the Communications Port from COM 1 to COM2.
 - Press the Down Arrow key repeatedly until the prompt Record To Disk? (Y/N): appears on the bottom of your screen.
 - Press Y to record the new configuration on your Smartcom II disk.
 - d. Switch Number 1 on the 1200B is set to COM1. You already have a serial device set to COM1.
- 9. If the Smartcom II main menu is not on the screen at this time, press F1.

Starting Up Smartcom II with a Fixed-disk System At this point the operating system files and the Smartcom II program files should already be recorded on the fixed disk.

Step Procedure

- 1. With the operating system prompt for the fixed-disk drive on the screen, type **SCOM** and press the return key.
- The computer loads the Smartcom II program and issues a reset command to the Smartmodem.
- 3. If Smartcom II is able to reset the Smartmodem, the Smartcom II main menu is displayed.

```
Smartcom II Hayes Microcomputer Products, Inc.

1. Begin Communication 2. Edit Set 4. Send File 7. Change Printer Status (OFF) 8. Select File Command 6. Change Configuration 9. Display Disk Directory (OFF) 0. End Communication/Program Press F2 For Help

Enter Selection: 1

Dials or answers phone with Smartmodem
```

03:08 Tuesday May 8, 1984

This completes the start-up procedure. If Smartcom II displays the following advisory screen, continue with Step 4.

Step

Procedure

			Smartcon	n II		
	Copyright	1983,1984	Hayes Micr	rocomputer	Products,	Inc.
		IBM PC	V2.0[_]	
			Stand By	/		

Smartmodem Not Responding on COM1: Press F1 To Continue
10:20 Tuesday September 4, 1984

- 4. The advisory message: Smartmodem Not Responding on COM1: means either:
 - a. The power switch on the rear of the freestanding Smartmodem is OFF. Verify that the switch is On (up).
 - b. The modem cable is not connected. Verify that the cable is properly connected to the modem and computer (freestanding modems only).
 - c. Your modem is set to COM2 because you have a serial device set to COM1. To change Smartcom II to COM2:
 - Press F1 to display main menu.
 - Select menu option 6, CHANGE CONFIGURATION.
 - Press the Down Arrow key until the cursor reaches the Communications Port line. (If you went too far, back up with the Up Arrow key.)
 - Press the Left Arrow key once to change the Communications Port from COM 1 to COM2.
 - Press the Down Arrow key repeatedly until the prompt Record To Disk? (Y/N): appears on the bottom of your screen.
 - Press Y to record the new configuration on your Smartcom II disk.
 - d. Switch Number 1 on the 1200B is set to COM1. You already have a serial device set to COM1.
- 5. If the Smartcom II main menu is not on the screen at this time, press F1.

System Configuration

Smartcom II makes certain initial assumptions about your equipment that reflect a typical operating environment. These assumptions are stored as values of the Configuration Screen. The settings of selected values pertaining to a printer, dialing method, and disk drives appear in the following table.

Value	Setting	Assumption
Printer Interface	PARALLEL	You have installed a parallel printer.
Printer Baud Rate	1200	Pertains to serial printers only.
Remove Extra Line Feeds	NO	Your printer advances the page after each line of data.
Add NULs	0	NUL characters need not follow each line of data.
Communications Port	COM 1:	Your Smartmodem is assigned to COM 1.
Dialing Method	PULSE	Your telephone exchange uses pulse dialing.
Available Disk Drives	А. В	You have installed two disk drives only (labeled A and B).
Monitor and Adapter	Monochrome Display with Monitor	You have installed a monochrome display adapter card.

If these values do not accurately represent your system's configuration, here is how you may change the entries on the Configuration screen:

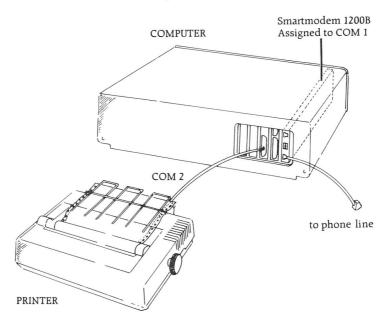
- 1. Select menu option 6, CHANGE CONFIGURATION.
- 2. Press the Down Arrow key until the cursor reaches the line of the configuration entry you want to change. (If you went too far, back up with the Up Arrow key.)
- 3. If there are two choices, press the Left Arrow key once to change the entry.
 - If there are more than two choices, press the Left Arrow key until the desired one appears.
 - To go back to the factory-assigned entry (the default value) press the space bar.
 - For an explanation of a particular entry, press the **Help Key** (F2). To return to the Configuration screen, press the Escape Key (F1).
- 4. When you have finished making changes, press the Down Arrow key repeatedly until the prompt Record to Disk? (Y/N): appears on the bottom of your screen.
- 5. Press Y to record the configuration changes on your Smartcom II disk.

Configuring the Communications Ports

The IBM Personal Computer supports two communications ports: COM1 and COM2. The Smartmodem is assigned to one of these ports and the serial printer to the other. Specify these assignments at the **Communications Port** entry on the Configuration Screen.

■ Set the Communications Port value to COM1 to inform Smartcom II that a serial printer is connected to COM2. or

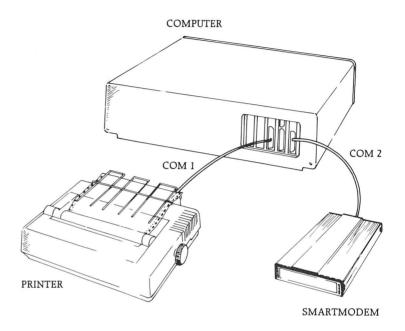
Smartmodem 1200B COM 1 Setup



NOTE: SET COMMUNICATION PORT ENTRY IN CONFIGURATION SCREEN TO COM 1.

Set the Communications Port value to COM2 to inform Smartcom II that a serial printer is connected to COM1.

Freestanding Modem COM 2 Setup



NOTE: SET COMMUNICATION
PORT ENTRY IN
CONFIGURATION
SCREEN TO COM 2.

If you are using the Smartmodem 1200B. be sure that the setting of configuration switch 1 corresponds to the setting provided to Smartcom II. When the modem is designated **COM1**, switch 1 should be in the up (ON) position; when it is designated **COM2**, switch 1 should be in the down (OFF) position.

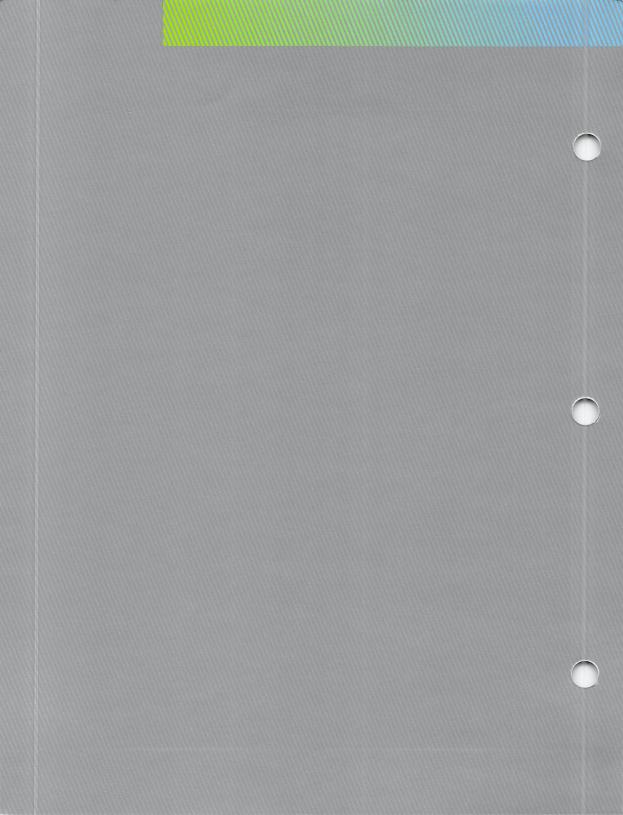
Printer Protocol

In addition to setting the Communications Port value, you must select a Printer Interface protocol. The program supports the following protocols: PARALLEL; SERIAL, NO PROTOCOL; SERIAL, DC1/DC3; SERIAL, ETX/ACK; SERIAL, RTS ON RS-232; SERIAL, DTR ON RS-232; and NO PRINTER. The default value for printer protocol is PARALLEL. Select the Configuration Screen and step through the available Printer Interface protocols until the desired protocol is displayed.

Note that if you select the protocol **DTR ON RS-232**. Smartcom II monitors pin 6 of the communications port for the busy signal. If you select **RTS ON RS-232**. Smartcom II monitors pin 5.

3 Getting Started

Chapter Objectives
Structure of Smartcom II
The Menu Screen
The Parameters Screen
The Macro Definition Screen
The Configuration Screen
The Create Screen
The On-line Screen
The Batch Set Directory
The HELP Feature
Introduction to Begin Communication



Chapter Objectives

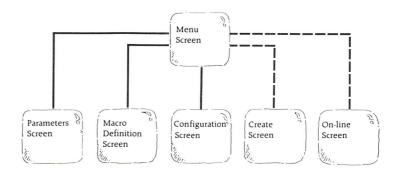
This chapter helps you to become better acquainted with Smartcom II and its structure. In addition, by following instructions in this chapter, you may communicate with a remote system for the first time via your new program. At this point your Smartcom II program should be installed (See Chapter 2) so you can look at the various screen displays while reading about them.

Strive to accomplish the following objectives.

- Understand the overall structure of Smartcom II
- Examine the Menu screen
- Identify Status Lines and their functions
- Become familiar with the various screens in Smartcom II
- Discover the usefulness of the Help Key and when it will assist you
- Participate in an example communication with an established Service

Structure of Smartcom II

Smartcom II comprises six different screens. Four of these screens are produced by Smartcom II. These include the Menu screen, the Parameters screen, the Macro Definition screen, and the Configuration screen. The other two screens, Create and On-line, develop as you enter data or as data is received from a remote system.



The Menu Screen

The menu screen is the starting place for accessing all Smartcom II features, commands, and other screens. It comprises four major areas: Menu Selections, Prompts, Directory, and Status Lines.



The menu selections, labeled 1-0, serve as a reference for the ten main functions provided by Smartcom II. Each option may be accessed by selecting the corresponding numeric label.

An asterisk appears in place of a label when another operation is being performed that prohibits the selection of that label. For example, Receive File and Send File functions can be selected only when "on-line" with another computer.

As the result of a menu selection, additional instructions, questions, and choices may be displayed. These prompts are displayed just below the menu. The selection of certain options causes other options to appear. Entering menu selections 7 or 9 only toggles the ON/OFF state of the menu selection. No further menu displays occur.

The first letter of the desired option may be entered for these prompts (i.e., P for Print). If you enter a character that the program considers invalid, the character is not accepted. You may also use the left and right arrows to toggle through all the options for a prompt. When you reach the desired option, press the Return key to activate the selection. To return to the prompt "Enter Selection," press the **Escape Key**.

Four directories are available through Smartcom II. They are displayed starting at the middle of the screen. The directories are:

1. Disk Directory	Displays the names of all files stored on
	the current disk. Menu selection 9, DIS-
	PLAY DISK DIRECTORY must be ON.

2. Communication Shows the names of the defined Communication Sets. This directory is accessed from menu option 1, BEGIN COMMUNICATION or menu option 2, EDIT SET.

3. Macro Directory Displays the names of all Macros defined for the current Communication Set.

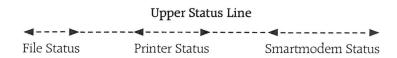
Menu option 2, EDIT SET, followed by the selection M for MACROS, produces this directory.

4. Batch Directory Displays the names of the defined Batch Sets. This directory is displayed by selecting Menu option 2, EDIT SET, followed by the selection B for BATCH.

Status Lines

Two lines of special information, called the Status Lines, appear on the twenty-third and twenty-fourth lines of the screen. They provide a constant update of program activity.

The upper line indicates the current status of files, the printer, and the modem.



File status information includes the name of the file which is currently accessed. The file name is displayed whenever a file command is being performed and when a file is being sent to a remote system. When receiving a file, the file name appears with a percentage value next to it. This percentage indicates the amount of incoming data stored in the memory buffer. The buffer is a section of memory which temporarily holds incoming data until it is recorded on disk. The file status information also includes the letter of the disk drive on which the current file is stored.

Information on the printer's status appears in the center of the upper Status Line. Three different messages may appear there. PRINTER:IDLE means that the printer is not currently receiving data but is *ready* to receive data. PRINTER:BUSY indicates that the printer is unable to accept data at present. PRINTER:WORK notes that the printer is presently at work—i.e., engaged in the printing process.

While on-line a percentage value indicates the current capacity of the printer buffer. When the printer buffer reaches 80% capacity, the program issues a **Stop Character** to the remote system. The program continues transferring data to the printer. When the buffer capacity lowers to 50% a **Start Character** is issued.

If the remote system does not recognize the **Stop Character** and continues to send data, the buffer accepts data until the 100% level is attained. Beyond that point, unless the remote system stops sending, the incoming data is lost. If data is lost, question marks appear among the printed text and asterisks replace the percentage value of received data on the upper status line.

Actions performed by the Smartmodem are displayed at the end of the upper Status Line. The name of the Communication Set for which an on-line connection is established is also displayed in this area if a Macro is sent, the name of the Communication Set is temporarily replaced with the Macro name.

The lower Status Line displays messages and special keys used during on-line communication. Error messages may appear at any time during program operation. They indicate the probable cause of any disruption to the program resulting from invalid entries, file transfer errors, loss of carrier, and other occurrences. For most of the error messages that appear on this line, you may press the **Help Key** to obtain a brief explanation of the message. Other messages indicate when a process has completed or indicate what action to take to continue or discontinue a process.

Only during on-line communication does the lower Status Line display the settings of the Keyboard Definitions as set on the Parameters screen. Note that the Statue Line display is inhibited when Character Processing is set to **DIRECT** in the active Parameter set

	,1	Lower Status			
Standard Values				_	
Menu: F1	Print: F3	Disk: F4	Macro: F5	Break: F6	
10:40:35	Wed	nesday April	18, 1984		

Menu: identifies the defined **Escape Key** which displays the Smartcom II menu at any time without disconnecting your system from the remote system.

Print: indicates the **Printer Key.** Press this key when you wish to route incoming data to the printer.

Disk: Identifies the defined **Capture Key.** Press this key when you wish to store incoming data onto disk, under the file name TEMP.

Macro: indicates the **Macro Prefix Key.** Use this key to send a Macro, followed by the label **A-Y** of the Macro you wish to send. (Macro **Z** is sent automatically after connection when originating a call.)

Break: indicates the **Break Key**, the key used to send a break signal to a remote system.

The Parameters Screen

This screen lists variables or parameters that you may define for creating an individual communication environment for each remote system that you call. Parameters include telephone number, baud rate, special keys, password, and others. Establishing parameter settings is discussed in Chapter 4.

```
PARAMETERS
                                                         Press F2 For Help
  Name of Set: F - DJN/R UNINET
         TRANSMISSION PARAMETERS
                                                            KEYBOARD DEFINITIONS
                                                      Escape Key: 128 (F1)
Help Key: 129 (F2)
               Duplex: FULL
                 Baud: 300
                                                Printer Key: 130 (F3)
Capture Key: 131 (F4)
Character Processing: FORMATTED
                                               Capture Key: 131 (rq)
Macro Prefix Key: 132 (F5)
Break Key: 133 (F6)
Break Length: 35 (0.01 sec.)
  Show Control Codes: NO
          Page Pause: NO
  Show Status Lines: YES
        Confidential: NO
                                                     Protect Key: 134 (F7)
  Include Line Feeds: NO
    Character Delay: 0 (0.001 sec.)
Line Delay: 0 (0.01 sec.)
                                                            PROTOCOL PARAMETERS
           Line Delay:
    Character Format: 7 DATA + EVEN + 1 STOP Receive Time-out: 60 (sec.)
             Emulator: TTY
                                                           Send Time-out: 10 (sec.)
                                            Error-Free Protocol: HAYES
                                             Stop/Start- Stop Char: 19 (DC3)
Start Char: 17 (DC1)
Send Lines- EOL Char: 10 (LF)
      TELEPHONE PARAMETERS
Answer On Ring: 1
Remote Access: NO
                           Password:
                                                             Prompt Char: 32 (" ")
  Phone Number:
                                  Tuesday May 8, 1984
  15:15:49
```

To view a typical Parameters Screen:

STEP 1: Select menu option 2

STEP 2: Press S for SELECT SET.

STEP 3: Choose a label (A-Z) from the Communication Directory.

STEP 4: Enter label (A-Z).

STEP 5: Press P to display the Parameters Screen.

STEP 6: Press Escape Key to return to Main Menu.

The Marco Definition Screen

This screen solicits the information required to make up a Macro. A Macro is a way of sending commands or information automatically to another system. Macros may include commands and data such as account numbers and passwords.

			MACRO DEFINITION Press F2 F	
			Micro Sales Set: G - KNOWLEDGE	INDEX Tel
Time-out	Pro	ompt	Data	Send CR
0	0	(off)	Begin Busi	YES
60	17	(DC1)	Find Microcomputer? and Sales	YES
60			Display s1/Medium/1-5	YES
60			Display s1/Long/1-3	YES

15:18:38 Tuesday May 8, 1984

To view a typical Macro Definition Screen:

STEP 1: Select menu option 2.

STEP 2: Press S for SET.

STEP 3: Choose a label (A-Z) from the Communication Directory.

STEP 4: Enter label (A-Z).

STEP 5: Press M to display the Macro Directory.

STEP 6: Choose a label (A-Z) from the Macro Directory.

STEP 7: Enter label (A-Z).

STEP 8: Press Escape Key to return to Main Menu.

The Configuration Screen

The Configuration screen displays the values you select to characterize your equipment. For example, the Dialing Method (pulse or Touch-Tone) to be used by the Smartmodem is included on the Configuration screen.

```
CONFIGURATION
                                                                           Press F2 For Help
PRINTER CONFIGURATION:
             Printer Interface: PARALLEL PORT
Printer Baud Rate: 1200
Remove Extra Line Feeds: NO
                                   Add NULs: 0
SMARTMODEM CONFIGURATION:
                    Communications Port: COM1:
                          Dialing Method: PULSE
                   Pause Time For Comma: 2 ( 0-255 seconds )
Touch-Tone Timing: 70 ( 50-255 0.001 seconds )
         Wait For Dial Tone: 2 (2-255 seconds)
Wait For Carrier Signal: 30 (1-255 seconds)
Recognize Carrier Signal: 6 (1-255 0.1 seconds)
Carrier Loss To Hangup Time: 7 (1-254 0.1 seconds)
                            Speaker Status: ON UNTIL CARRIER
SPECIAL VALUES:
                                Default Set: Z
                 Available Disk Drives: AB
Monitor and Adapter: MONOCHROME DISPLAY ADAPTER WITH MONITOR
                            Log-on Message: Smartcom II - IBM Personal Computer
                                          Tuesday May 8, 1984
   15:23:29
```

To view the Configuration Screen:

STEP 1: Select menu option 6.

STEP 2: Press Escape Key to return to Main Menu.

The Create Screen

The Create screen differs from those just discussed because it is developed as text is entered from the keyboard when you create a file. Further information is provided in Chapter 5 under the "Create File" Heading.

The On-line Screen The On-line screen also develops as input is generated from your system and from the remote system as well. Once you are connected to a remote computer system the menu screen is replaced by the On-line screen to enable you to see the responses from the remote computer system. When the On-line screen is displayed, the lower Status Line keeps you informed of the currently defined keyboard characters that activate special features.

The Batch Set Directory

The Batch Set Directory is a listing of all Batch Sets. Each time a Batch Set is added, deleted, or its name changed, the directory is updated. The directory appears on the screen whenever the B(atch option is selected from menu option 2, EDIT SET.

```
Smartcom II
                            Hayes Microcomputer Products, Inc.
1. Begin Communication *. Receive File 7. Change Printer Status (OFF) 2. Edit Set *. Send File *. Select Remote Access (OFF)
3. Select File Command 6. Change Configuration 9. Display Disk Directory (ON)
A,B - Change Drive
                                                  O. End Communication/Program
                        Press F2 For Help
                     P(arameters, M(acros, R(eports, C(opy, S(et, B(atch: B
Enter Selection: 2
R(ecord, E(rase, P(layback, *(top Record: R
                       Starts keystroke recording process
Batch Directory:
A - COMPUSERVE WEATHER
B - GET DOW JONES QUOTES
                            K -
                                                         T -
C - KI INFO ON UNIX
                                                         U -
D - PRINT MCI MAIL BOX
E - ATL; LAX VIA OAG
F - READ SOURCE MAIL
                             0 -
G -
H -
                             0 -
                                                         Z - Automatic Startup
I -
 15:25:07
                               Tuesday May 8, 1984
```

To view the Batch Set Dirctory screen:

- STEP 1: Select menu option 2, EDIT SET.
- STEP 2: Press B to select Batch Set option.
- STEP 3: Press Escape Key to return to Main Menu.

The Help Feature

Smartcom II includes a "Help" feature which is available whenever information is requested by the program.

If help is needed for any item on the Macro Definition. Parameters, or Configuration screen, press the Help Key and a full screen of text appears. The item in question also appears at the top of the Help screen so that you may change the value or setting while reading the explanation. Press Return to return to your original screen position, which now contains the updated setting.

Baud: 1200

This parameter determines the rate at which data is transmitted by the modem over the telephone lines. The rate selected must be the same as the transmission rate of the remote system. When the transmission rate is improperly set, unintelligible data appears on the screen if a connection is made at all.

The Smartmodem 300 communicates at 110 or 300 bps. The Smartmodem 1200 communicates at 110, 300, or 1200 bps. If answering the phone with your Smartmodem, the baud rate value is automatically changed to match the baud rate of the originating modem.

15:27:49

Tuesday May 8, 1984

In addition to the one-line help messages on the menu screen, help for each prompt may be obtained by pressing the **Help Key**. This produces information across the bottom half of the screen. If DISPLAY DISK DIRECTORY is ON, the Directory is replaced by this information; the menu remains intact. After reading the help explanation, make a selection.

```
Smartcom II
                                     Hayes Microcomputer Products, Inc.
1. Begin Communication *. Receive File
                                                                  7. Change Printer Status (OFF)
2. Edit Set
                                *. Send File
                                                                 *. Select Remote Access
3. Select File Command 6. Change Configuration 9. Display Disk Directory (ON) A,B - Change Drive 0. End Communication/Program
                                 Press F2 For Help
Enter Selection: 1
                                 O(riginate, A(nswer, D(ata: 0
Enter Label: Z
                                 Phone Number:
Enter the phone number of the remote computer. Prompt is displayed when using Communication Set Z (manual dial) or if the phone number entry is not defined. The last phone number dialed is automatically filled in here.
Press CTRL-X to erase the field.
Valid characters are: 0..9 # * T P , - ( ) and a space.
  15:31:44
                                        Tuesday May 8, 1984
```

Introduction to Begin Communication

To acquaint you with network services and familiarize you with some basic features of Smartcom II. step-by-step guides for establishing on-line communication via two networks are provided in this section.

Example 1: Contacting THE SOURCE via Telenet

Smartcom II contains a predefined Communication Set for contacting THE SOURCE; personalize this Set by adding four items of information. Add the correct **Baud** Value, the **Phone Number**, your assigned account number, and password.

Follow the checklist below to make these changes.

- STEP 1: Determine the baud rate at which you will communicate with THE SOURCE.
- STEP 2: Obtain the telephone number for Telenet, Sourcenet, or Uninet. THE SOURCE may be accessed through any of these networks; however, Telenet is used in the example. The procedure for obtaining the Telenet number is included near the end of Chapter 9.

- STEP 3: Obtain your account number and/or password from THE SOURCE. To obtain an account number, refer to the material under "THE SOURCE" heading in Chapter 9.
- STEP 4: From the Smartcom II menu, select option 2, EDIT SET. Press **S** for SET.
- STEP 5: The Communication Directory then appears. Enter label N for THE SOURCE Telenet.
- STEP 6: Press P to produce the Parameters screen.
- STEP 7: Move the cursor to Baud by pressing Return.

 Notice that the current setting is 1200 baud. If the remote system operates at 300 bps, change the setting to 300 by pressing the right arrow key.

 When you have made the proper setting, press Return to move the cursor down the screen to Phone Number.
- STEP 8: Type in the telephone number of the service you wish to contact. If your telephone system is Touch-Tone, place a T in front of the number (i.e., T555-2368). Press return.

Note: If you normally dial a "9" for an outside line, type T9, 555-2368.

STEP 9: Again press return and a question appears.

Record to Disk? (Y/N):

- STEP 10: Enter Y for YES. All of the new Parameters are now recorded on your disk. The Smartcom II menu reappears.
- STEP 11: Select menu option 2. EDIT SET.

- STEP 12: Press M for MACROS. The Macro Directory appears.
- STEP 13: Enter label **Z**, **Automatic Log-on**, from the Macro Directory. The Macro Definition screen then appears.

Note: The log-on process required by a remote system may change at any time. Periodically review the procedures for the information service you are using. If you have problems logging on, a more detailed explanation of Macros is included with the next chapter.

- STEP 14: Continue to press Return until you reach the line that contains the statement: Enter computer host system number on this line. The cursor should be located at the end of the word "line." Use the left arrow to backspace to the beginning of the line, or press CTRL-X to delete the data. Then enter in its place your account number, as provided by the information service. Press the return key to move to the next column.
- STEP 15: Press **Return** until the cursor appears on the **Data** line which contains the entry **Enter Account Number on this line**. Delete this line of data and enter your assigned information service account number.
- STEP 16: Continue to press **Return** until you reach the **Data** line that contains the entry **Enter Password on this line**.

 Again delete the line and enter your password for the information service.
- STEP 17: When the account number and/or password have been entered correctly, press the **Escape Key**.
- STEP 18: When the question R(ecord, I(gnore, E(rase appears, press R to Record the Macro on disk.

The Smartcom II menu is redisplayed.

Follow the same steps for changing the Communication Set for each of the information services discussed.

Originating a Call to THE SOURCE via Telenet.

Now that you have updated the Communication Set, you are ready to communicate. Follow the example below to contact THE SOURCE via Telenet

- STEP 1: From the Smartcom II Menu screen, press 1 to BEGIN COMMUNICATION.
- STEP 2: Press O to ORIGINATE the call.
- STEP 3: The Communication Directory then appears. Select the label **N** for THE SOURCE Telenet. Smartcom II sends the telephone number to the Smartmodem. When connection is made, the On-line screen appears, the Status Lines appear, and the **Automatic Log-on** Macro is executed.
- STEP 4: When THE SOURCE main menu appears, select any of the options listed to familiarize yourself with the service. Or, activate one of the Macros in the Communication Set for THE SOURCE. (To activate another Macro, press the Macro key, then enter the desired Macro label).
- STEP 5: To exit the on-line information service, type **OFF** to signal the end of your communication.
- STEP 6: Press the **Escape Key** to redisplay the Smartcom menu.
- STEP 7: Press O to END COMMUNICATION.
- STEP 8: At the prompt **H(ang up, V(oice, E(xit program:** enter **H** if you wish to hang up the telephone and continue using Smartcom.

Example 2: Contacting CompuServe via Tymnet

Smartcom II contains a predefined Communication Set for contacting CompuServe; personalize this Set by adding four items of information. Add the correct **Baud** value, the **Phone Number**, your assigned account number, and password.

Follow the checklist below to make these changes.

STEP 1: Determine the baud rate at which you will communicate with CompuServe.

STEP 2: Obtain the telephone number for CompuServe Network Services, Telenet, Tymnet, or Datapac. CompuServe may be accessed through any of these networks; however, Tymnet is used in the example. The procedure for obtaining the Tymnet number is included near the end of Chapter 9.

STEP 3: Obtain your User ID number and password from CompuServe. To obtain each, refer to the material under the "CompuServe" heading in Chapter 9.

STEP 4: From the Smartcom II menu, select option 2, EDIT SET. Press **S** for SET.

STEP 5: The Communication Directory then appears. Enter label C for CompuServe Tymnet.

STEP 6: Press P to produce the Parameters screen.

STEP 7: Move the cursor to **Baud** by pressing **Return**.

Notice that the current setting is 1200 baud. If the remote system operates at 300 bps, change the setting to 300 by pressing the right arrow key.

When you have made the proper setting, press Return to move the cursor down the screen to **Phone Number**

STEP 8: Type in the telephone number of the service you wish to contact. If your telephone system is Touch-Tone. place a T in front of the number (i.e., T555-2368). Press return.

Note: If your normally dial a "9" for an outside line, type T9, 555-2368.

STEP 9: Again press return and a question appears.

Record to Disk? (Y/N):

STEP 10: Enter **Y** for YES. All of the new Parameters are now recorded on your disk. The Smartcom II menu reappears.

STEP 11: Select menu option 2, EDIT SET.

STEP 12: Press M for MACROS. The Macro Directory appears.

STEP 13: Enter label **Z**. **Automatic Log-on**. from the Macro Directory. The Macro Definition screen then appears.

Note: The log-on process required by a remote system may change at any time. Periodically review the procedures for the information service you are using. If you have problems logging on. a more detailed explanation of Macros is included with the next chapter.

STEP 14: Press **Return** until you reach the Macro data line containing **77770,111**. Type **CTRL-X** to delete the number, then enter your User ID number in its place.

STEP 15: Continue to press **Return** until you reach the Macro data line containing **FREE-DEMO**. Type **CTRL-X** to delete the entry, then enter your password in its place.

STEP 16: When the account number and password have been entered correctly, press the defined **Escape Key**.

STEP 17: When the question R(ecord, I(gnore), E(rase) appears, press R to record the Macro on disk.

The Smartcom II menu is redisplayed.

Originating a Call to CompuServe via Tymnet:

After you have updated the Automatic Log-on Macro Z for the CompuServe Tymnet, you are ready to communicate. All other Macros for accessing CompuServe via Tymnet are identical to the CompuServe Network Macros.

- STEP 1: From Smartcom II menu screen, press 1 to BEGIN COMMUNICATION.
- STEP 2: Press **O** to ORIGINATE the call.
- STEP 3: The Communication Directory then appears. Select the label **C** for CompuServe Tymnet. Smartcom II sends the telephone number to the

Smartmodem. When connection is made, the Online screen appears, the Status Lines appear, and the Automatic Log-on Macro is executed.

- STEP 4: When the CompuServe main menu appears, select any of the options listed to familiarize yourself with the service. To exit CompuServe, proceed with Step 9.
 -or, activate one of the Macros in CompuServe Network Communication Set **C** as follows in Steps 5-8.
- STEP 5: Press **Escape Key** to display the Smartcom II menu screen.
- STEP 6: Press **2SCM** (2 selects the EDIT SET, SC selects the COMMUNICATION SET for CompuServe Network, and M displays the corresponding MACRO labels). Look at the Macro Directory and note the label (A-Z) of the Macro you would like to use.
- STEP 7: Press Escape Key twice to return on-line.
- STEP 8: Press **Macro Key** to activate Macro selection.
- STEP 9: Enter the desired Macro label.

When the CompuServe menu appears, select any of the options listed. Note commands necessary for obtaining help, for going back to the previous menu. and for logging off.

- STEP 10: To exit the on-line information service or to select another information service, sign off with the command **OFF**.
- STEP 11: To signal the end of your communication with CompuServe Tymnet, type **OFF**.
- STEP 12: Press the **Escape Key** to redisplay the Smartcom II menu.
- STEP 13: Press O to END COMMUNICATION.
- STEP 14: At the prompt **H(ang up, V(oice, E(xit program:** enter **H** if you wish to hang up the telephone and continue using Smartcom.

Working with Communication Sets

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Objectives

This chapter helps you to accomplish the following objectives toward understanding and using Communication Sets.

- Learn to identify operating parameters of a remote computer system
- Examine a Communication Set
- Select parameter values
- Define and develop Macros
- Prepare an automatic log-on sequence
- Delete, edit, and copy Communication Sets
- Learn to store Communication Sets to speed up and simplify your installation procedures
- Learn to record and play back Batch Command Sets

Introduction to Communication Sets

Definition: The Communication Set specifies the way in which your computer system and a remote system communicate with each other. A Communication Set contains such things as the telephone number, parameters, macros, and a log-on sequence used to reach another computer.

The Smartcom II disk stores several predefined Communications Sets. Other Sets may be defined by you.

Before you originate or answer a call, the program displays a Communication Directory. It lists the names of the remote systems you may call. For each Set (each system), you may define thirty-two communication parameters and up to twenty-six Macros (discussed later) to ensure that they systems can communicate with each other. The *twenty-sixth* Macro is reserved for a log-on sequence automatically activated when connection is made with a remote system.

Examining the Communication Set

The names of all currently defined Communication Sets are contained in the Communication Directory. Twenty-five Sets may be defined: the twenty-sixth set (**Z**, **Standard Values**) contains predefined values that may not be changed.

Each Communication Set comprises one group of parameters and twenty-six Macros, one of which is the **Automatic Log-on** Macro. Macros may not be defined for Set **Z**. The following diagram shows the structure of a Communication Set.

■ Select option 2, EDIT SET. Press S for SET. Enter Label C.

```
Hayes Microcomputer Products, Inc.
   Smartcom II
                                                     7. Change Printer Status (OFF)
1. Begin Communication *. Receive File
2. Edit Set *. Send File *. Select Remote Access (OFF 3. Select File Command 6. Change Configuration 9. Display Disk Directory (ON)
                                                                                  (OFF)
2. Edit Set
                                                     O. End Communication/Program
A.B - Change Drive
                          Press F2 For Help
                          P(arameters, M(acros, R(eports, C(opy, S(et, B(atch: S
Enter Selection: 2
           Displays communication set directory; activates selected set
Communication Directory:
                              J - OAG EE Telenet
K - OAG EE Tymnet
                                                             S - CompuServe Datapac
 A - CompuServe
                                                            T - DJN/R Datapac
 B - CompuServe Telenet
 C - CompuServe Tymnet
                             L - OAG EE UNINET
                                                            U - KNOWLEDGE INDEX Data
                              M - THE SOURCE SOURCENET
N - THE SOURCE Telenet
                                                            V - OAG EE Datapac
 D - DJN/R Telenet
                                                            W - THE SOURCE Datapac
 E - DJN/R Tymnet
 F - DJN/R UNINET
                              0 - THE SOURCE UNINET
                                                            X -
 G - KNOWLEDGE INDEX Tel
                              P -
                                                             Y - Remote Access
                              0 -
                                                             Z - Standard Values
 H - KNOWLEDGE INDEX Tym
 I - MCI Mail
```

Press P for PARAMETERS

(Each Communication Set has its own Parameters)

Press M

for Macros

```
PARAMETERS
                                                        Press F2 For Help
 Name of Set: C - CompuServe Tymnet
         TRANSMISSION PARAMETERS
                                                          KEYBOARD DEFINITIONS
                                                      Escape Key: 128 (F1)
Help Key: 129 (F2)
               Duplex: FULL
                 Baud: 300
                                                     Printer Key: 130 (F3)
Character Processing:
                        FORMATTED
                                                     Capture Key: 131 (F4)
  Show Control Codes: NO
                                              Macro Prefix Key: 132 (F5)
          Page Pause:
                        NO
                                                    Break Key: 133 (F6)
Break Length: 35 (0.01 sec.)
Protect Key: 134 (F7)
   Show Status Lines:
                        YES
        Confidential:
                        NO
  Include Line Feeds:
                         NO
    Character Delay:
                         0 (0.001 sec.)
                          0 (0.01 sec.)
                                                           PROTOCOL PARAMETERS
          Line Delay:
                        7 DATA + EVEN + 1 STOP
                                                   Receive Time-out: 60 (sec.)
    Character Format:
                                                          Send Time-out: 10 (sec.)
            Emulator: TTY
                                                   Error-Free Protocol: HAYES
                                                 Stop/Start- Stop Char: 19 (DC3)
Start Char: 17 (DC1)
      TELEPHONE PARAMETERS
Answer On Ring:
                                                  Send Lines- EOL Char: 10 (LF)
Prompt Char: 32 ("")
Remote Access: NO
                          Password:
 Phone Number:
```

(Each Communication Set has a Macro Directory)

```
Smartcom II
                           Hayes Microcomputer Products, Inc.
1. Begin Communication *. Receive File
                                                 7. Change Printer Status
                                                                           (OFF)
2. Edit Set
                         *. Send File
                                                 *. Select Remote Access
3. Select File Command
                        6. Change Configuration 9. Display Disk Directory (ON)
A,B - Change Drive
                                                O. End Communication/Program
                        Press F2 For Help
Enter Selection: 2
                        P(arameters, M(acros, R(eports, C(opy, S(et, B(atch: M
Enter Label: I
Macro Directory:
 A - Atlanta Weather
                            J - MicroQuote
                                                       S - Read Your Mail
 B - Text Editors
                            K - Standard & Poor's
                                                       T - New Product Data
 C - Special Interest Grp
                            L - S & P Tandy Report
                                                       U - Commodities
 D - Game Index
                            M - Microsoft
                                                       V - Consumer Medicine
 E - Hangman (Game)
                            N - What's New
                                                       W - Send Mail
 F - Personality Profile
                            0 - Run CB
                                                       X - Complete Index
 G - Loan Payment Sched.
H - Mark Steven's Report
                            P - CB Instructions
                                                       Y - Telephone Access No.
                            Q - Special Interest Law
                                                       Z - Automatic Log-On
                            R - Investor Protection
 I - News Headlines
Enter Label A
                                          (Each Macro label is associated
```

with a Macro definition)

```
MACRO DEFINITION
                                                        Press F2 For Help
Name Of Macro: A - Atlanta Weather
                                               Set: C - CompuServe Tymnet
Time-out Prompt
                      Data
                                                                         Send CR
           0 (off) GO CIS-1
33 ("!") 1
                                                                           YES
                                                                           YES
                                                                           YES
                                                                           YES
```

Communication Set names are entered on the Parameters screen by you. Smartcom II only displays set names in the Communication Directory to help you differentiate between Sets. Names may be up to twenty characters long.

The Smartcom II disk is produced with standard settings defined for every Communication Set. These values may be changed at any time to suit your requirements, for every Set except Set ${\bf Z}$.

The Unique Communication Set Z

To reiterate, Communication Set Z. Standard Values, cannot be changed or edited and never has any Macros associate with it. This Set is included in the program for the following reasons.

- 1. To provide a reference point where typical parameter values may be obtained.
- 2. To reserve one Set for telephone numbers entered directly from the keyboard; a telephone number cannot be stored for this Set.
- 3. To enable you to restore standard parameter values and delete unnecessary Macros in the other Communication Sets. (Described under heading "Erasing Communication Sets").

Name of Set: Z - Standard Values

```
KEYBOARD DEFINITIONS
          TRANSMISSION PARAMETERS
                Duplex: FULL
                                                           Escape Key: 128 (F1)
                                                             Help Key: 129 (F2)
                  Baud: 1200
Character Processing: FORMATTED
                                                        Printer Key: 130 (F3)
  Show Control Codes: NO
                                                        Capture Key: 131 (F4)
                                                 Macro Prefix Key: 132 (F5)
Break Key: 133 (F6)
Break Length: 35 (0.01 sec.)
           Page Pause: NO
   Show Status Lines:
                          NO
         Confidential:
                                                        Protect Key: 134 (F7)
  Include Line Feeds: NO
     Character Delay:
                          0 (0.001 sec.)
0 (0.01 sec.)
                                                                PROTOCOL PARAMETERS
           Line Delay:
    Character Format: 8 DATA + NONE + 1 STOP Receive Time-out: 60 (sec.)
Fmulator: TTY Send Time-out: 10 (sec.)
             Emulator: TTY
                                                       Error-Free Protocol: HAYES
                                                     Stop/Start- Stop Char: 19 (DC3)
Start Char: 17 (DC1)
Send Lines- EOL Char: 10 (LF)
Prompt Char: 32 ("")
      TELEPHONE PARAMETERS
Answer On Ring:
 Remote Access: NO
                            Password:
  Phone Number:
```

Standard Values May Not Be Changed Press F1 To Continue.

Introduction to Edit Set

EDIT SET accesses functions that enable you to modify and examine Communication Sets. These functions are PARAMETERS, SET, REPORTS, COPY, MACROS, AND BATCH.

The first three of these commands are most important when creating a new Communication Set.

Command	Action
SET	Allows you to select one of 26 Communication Sets. The selected Communications Set is considered "active."
PARAMETERS	Displays Parameters screen for currently selected Communication Set.
MACROS	Displays Macro Directory for currently selected Communication Set and requests "Macro Label" to be entered.
ВАТСН	Displays Batch Set Directory along with prompts for further actions with Batch Sets.

The REPORT and COPY commands are discussed later in this chapter.

Set

The SET command is used to change from one Communication Set to another. For example, suppose you have just finished communicating with a remote computer using Communication Set A. If you want to operate in another Communication Set, press S. for Set and, when prompted for a new Set, enter its label.

Parameters

Definition: Parameters are variables that determine the communication characteristics of a particular Set.

Parameters are divided into four main categories: Transmission Parameters, Keyboard Definitions, Protocol Parameters, and Telephone Parameters. Transmission Parameters determine the manner in which characters are sent to and from the modem, displayed on the screen, and formatted for the printer and disk file. Check the value of these parameters first when transmission between two systems does not seem to be working.

Keyboard Definitions allow you to define a key to be used to activate a particular function. Special keys or seldom-used control characters are best used for this purpose. You may wish to select the same keys that you use with other programs for similar functions.

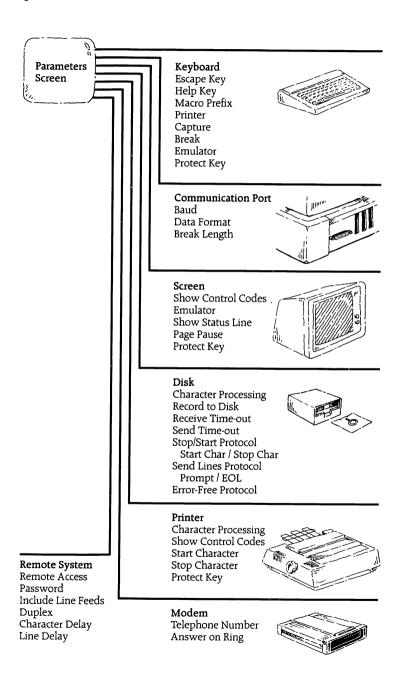
Protocol Parameters enable the "handshaking" process to take place between communication devices during file transfer.

The Telephone Parameters are normally entered once, when the Communication Set is initially created. These parameters are related to the BEGIN COMMUNICATION menu option.

The Parameters screen includes thirty-two different items. This may seem like a lot of options to select. Keep in mind, however, that each parameter has a standard value associated with it, based on the most typical communication environment.

Relating Parameters To Your System The diagram below indicates how each parameter influences the equipment involved in communication. Note that some parameters affect more than one item.

Parameters Screen



Remote System Parameters

Before you create a Communication Set, you should have ready certain information about the remote system. This information will be used for setting Parameters. Below is a checklist to help you obtain this information before contacting the remote data base or time-sharing system. Answers to the questions are generally provided in the user's manual for the remote system.

Does the remote system require half or full duplex operation?	If an incorrect value is selected, simply go to the Parameter screen and change it. Chap- ter 7, Troubleshooting, describes the results of selecting the wrong value. TO CHANGE: Press Left/Right Arrow.
What baud rates are supported?	300 bps and 1200 bps are the most common rates. If you are answering the call, setting the value is not as important; Smartcom II automatically changes the baud rate to match the rate of the originating system (provided that the modem is capable of that speed).
	TO CHANGE: Press Left/Right Arrow
Does the remote system require a certain parity	Computers communicating with each other should use same Character Format , which may include a parity bit.
setting?	TO CHANGE: Press Left/Right Arrow.
Are there any special keys used by the remote system?	Review the current values for the Keyboard Definitions shown on the Parameters screen. These characters perform special functions by the program. When entered at the keyboard, they are not transmitted by the modem. If any of the characters listed have a special meaning to the remote system and must be transmitted, redefine the

identified on the Parameters screen.

TO CHANGE: Press Left/Right Arrow.

key Smartcom II will recognize that key when you press it and perform the function

Does the remote system recognize a particular Stop/Start code?	If the system you are calling uses special characters to start and stop transmission, enter the values here. Your Stop/Start Characters must match those of the remote system.
	TO CHANGE: Press Left/Right Arrow.
☐ What is the telephone number?	A maximum of thirty-eight characters may be entered. The comma and the characters T and P may be included in the telephone number to indicate special actions.
	, causes a delay for the period of time specified on the Configuration screen. T selects Touch-Tone dialing of the numbers that follow. P selects pulse dialing of the numbers that follow. Example Telephone Numbers:
	T9,P555-2368 (Touch-Tone, dial 9 for outside line, pause, pulse dial the following numbers)
	555-2368 14045552368
	TO CHANGE: Enter digits or characters.
What is the exact log-on sequence that must be entered for the remote system?	The required information usually includes an account number, password, prompts, and time-out delays. More details on enter- ing this information is provided in Develop- ing Your Own Macros, later in this chapter.

Additional Parameters

The Remote System Parameters (Items 1-7 above) introduced the parameters essential for communicating with another computer system. Listed here are the remaining entries that you must become familiar with as you continue to use Smartcom II. The discussion of each entry is intended as an overview only.

Character Processing

DESCRIPTION: Smartcom II filters incoming data for control characters that may be undesirable or that may not be interpreted by your computer as intended.

The setting FORMATTED activates the process. The setting DIRECT causes Smartcom II not to examine characters. It is recommended that DIRECT be used only by the experienced computer user with a particular application in mind.

TO CHANGE: Press Left/Right Arrow.

Show Status Lines

DESCRIPTION: These lines, displayed at the bottom of the screen, continuously inform you of the program's status. Since some information networks format output for display, you may eliminate the status lines when you need all twenty-four lines of the screen.

TO CHANGE: Press Left/Right Arrow.

Show Control Codes

DESCRIPTION: This parameter enables the display of control codes used to perform special functions. Knowing the control codes is often useful when creating Macros.

TO CHANGE: Press Left/Right Arrow.

Page Pause

DESCRIPTION: This parameter causes the display of incoming data to pause after every twenty-two lines (twenty-four if **Show Status Lines** is OFF). Striking any key causes the next twenty-two lines of information to be displayed. Page Pause is optional.

TO CHANGE: Press Left/Right Arrow.

Confidential

DESCRIPTION: Use this option during a file transfer when you do not want to display outgoing or incoming information. The menu remains displayed on the screen. Status Lines are displayed to keep you informed of the process.

The confidential feature also keeps the **Automatic Log-on** data from being displayed on the screen and from appearing in the Display Buffer.

TO CHANGE: Press Left/Right Arrow.

Answer on Ring

DESCRIPTION: Smartcom II allows you to specify the number of ringing signals that must occur before the Smartmodem automatically answers a call.

TO CHANGE: Press Left/Right Arrow.

Include Line Feeds

DESCRIPTION: The line feed character causes the cursor to advance one line. It ensures that lines are correctly spaced, regardless of the method used by a remote system.

TO CHANGE: Press Left/Right Arrow.

Character Delay

DESCRIPTION: This parameter allows

you to set a time lapse between trans-

mitted characters.

TO CHANGE: Press Left/Right Arrow.

Line Delay

DESCRIPTION: This parameter allows you to set a time lapse following a return and preceding transmission

of the next line.

TO CHANGE: Press Left/Right Arrow.

Emulator

DESCRIPTION: This parameter allows you to select one of four common emulators for making your computer terminal emulate another terminal.

nai emulate another terminar.

TO CHANGE: Press Left/Right Arrow.

Remote Access

DESCRIPTION: Provides the originator of a call with control of the answering computer for transferring files between the two computers.

TO CHANGE: Press Left/Right Arrow.

Changing Parameter Values

The Left/Right Arrows may be used to change a parameter's predetermined settings. Changes to Parameter settings may also be made in other ways, depending on the particular item.

Feel free to experiment with Parameter settings: the program will not accept an invalid entry. Press the space bar to return to the standard setting stored for a particular entry.

The additional methods for making changes to your Parameters are described below.

- For an entry containing two or more choices, you need only enter the first letter of your choice (i.e., "F" for Full, "H" for Half-Duplex).
- For entries requiring a numeric value, you may enter the number directly (i.e., "45").
- For entries containing a series of characters, you may backspace over the entry by using the Delete, Backspace, or Left Arrow keys and then enter the correct characters. Control-X deletes the line.
- For Keyboard Definition entries you may enter the desired key directly (i.e., press the key) or enter the ASCII decimal value for that character.*

Note: The space bar is used to return a parameter to its standard stored value. You may not press the space bar to set a parameter to a space. Instead, enter the ASCII decimal value (32) to select the space for a parameter.

To move from one Parameter to the next, use the return key.

^{*}Smartcom II uses the decimal value of the ASCII Character Set to reference keyboard characters.

Macros

Definition: The term "Macro" (short for macroinstruction) describes the Smartcom II facility that allows you to send. from disk, a sequence of instructions to a remote system. The instructions are processed by the remote system as if they had been entered from the remote system's keyboard.

Smartcom II provides for two types of Macros. One Macro in each Communication Set is reserved for the log-on information required by a remote system. This Macro, labeled ${\bf Z}$ is automatically sent to the remote system by Smartcom II when you originate a call and a carrier signal is detected.

The other type of Macro is activated by you after connecting with a remote system. Each Communication Set contains twenty-five of this type of Macro, labeled **A-Y**. Macros are accessed from the Macro Directory.

If desired, confidential entries in Macros can be protected by pushing the **Protect Key**. The protected information will then appear as ***PROTECTED*** on the screen and in printed copies.

```
Haves Microcomputer Products, Inc.
   Smartcom II
1. Begin Communication *. Receive File
                                                 7. Change Printer Status (OFF)
2. Edit Set *. Send File *. Select Remote Access (OFF 3. Select File Command 6. Change Configuration 9. Display Disk Directory (ON)
                                                 O. End Communication/Program
A,B - Change Drive
                        Press F2 For Help
                        P(arameters, M(acros, R(eports, C(opy, S(et, B(atch: M
Enter Selection: 2
Enter Label: A
                                                        S - CHI-MINAPLS/S
                            J - NYC-DENVER/S
 A - NYC-LA/S
                           K - NYC-LONDON/S
                                                        T - CHI-LA/S
 B - NYC-LA/F
                                                       U - CHI-MIAMI/S
 C - NYC-MIAMI/S
                            L - NYC-TORONTO/S
                           M - LA-FRISCO/S
                                                        V - BOSTON-LA/S
 D - NYC-MIAMI/F
                                                        W - BOSTON-MIAMI/S
                           N - LA-DALLAS/S
 E - NYC-WASH DC/S
                            O - LA-HONOLULU/S
                                                        X - BOSTON-PARIS/S
 F - NYC-WASH DC/F
G - NYC-BOSTON/S
                           P - LA-MEXICO CITY/S
                                                        Y - BOSTON-ATLANTA/S
                            Q - CHI-ATLANTA/S
                                                        Z - Automatic Log-On
 H - NYC-CHI/S
                             R - CHI-DENVER/S
 I - NYC-DALLAS/S
```

Tuesday May 8, 1984

15:49:11

Macro Operation

When you are on-line with a remote computer and you wish to send a Macro, press the Macro Prefix Key (defined on the Parameters screen for the Communication Set) followed by the Macro label (the letter A-Y that corresponds with the Macro).

After you press the Macro Prefix Key, only letters A-Z are accepted. Press the Escape Key at any time to abort the process.

The macro Definition screen contains four columns to help you describe the Macro. These columns are discussed below.

Time-out The amount of time the program allows to elapse without data being received through the modem.

The character used by a remote system to indicate

that it is ready to accept a line of Data.

The actual information to be sent (e.g., password, Data

account number, commands). To enter control codes, prefix the character with a caret (e.g., " \land C"

sends CTRL-C).

Prompt

Send CR Option for sending a return character after the last

character in the Macro **Data** line. Select YES or NO. (Pressing the return key while the cursor is positioned in the **Data** column does not include a return in the data: it advances the cursor to the next column. To include a return, enter \land M).

In most cases, the **Prompt** will suffice to control the sending of the Macro. Sometimes, however, the character is not received correctly or the **Prompt** you enter is incorrect. To guard against these problems, **Time-Out** is included. It controls the sending of the Macro independent of the actions of the remote system.

Special Operations

- 1. To force the program to send the next **Data** line before the **Prompt** is received or **Time-out** elapses, press any key (except the defined **Escape Key** or **Printer Key**).
- 2. To stop sending the Macro, press the Escape Key.
- 3. To ensure that the character received is indeed the **Prompt** character (and not the **Prompt** being used by the remote system for another purpose as well), a half second of idle time must occur after the **Prompt** is received. The half-second idle time is an automatic feature.

Developing Your Own Macros

Several features are included in Smartcom II to assist you with developing Macros. Follow the steps listed below to develop log-on and other Macros.

Step

Description

 Learn commands used by remote computer system.

Enter commands directly from keyboard. Write down the remote system commands that you want to incorporate into Macros.

2. Use your printer to document the session with a remote computer.

Before originating a call to a remote system, select menu option 7 to turn the printer ON. Make sure the printer is ready to accept data.

 Set certain parameters to record all characters.

Two parameters on the Parameters screen should be set to specific values when developing Macros.

- 1. Select DIRECT **Character Processing** option.
- Enter Y under Show Control Codes. Control characters received by Smartcom II are specially displayed.
- Originate call to remote system and enter its log-on sequence.

Since both systems have **Duplex** set to FULL, the data you send and that sent by the remote system are included in the printout.

Note: Systems that do not echo

data will not display information typed by you nor show it on the printer.

Execute commands you wish to include in Macros. After sending each remote system command, note the next prompt and the time that elapses before its arrival.

6. Log-off remote system and review printer output.

Circle each entry you made, including the log-on information. This data will be typed as Macro **Data**.

For each line, note the last character sent by the remote system. (Remember, spaces are characters too!) On some computer systems this character may be a control code shown by Smartcom II as a caret followed by a character. This character will be entered as a **Prompt** on the Macro Definition screen.

Make notes on your listing of any unusual time delays that occurred.

7. Enter Macro.

From the Smartcom II menu, select **2** EDIT SET. Select **M** for Macros.

Enter Macro label, A-Z, for the particular Macro.

The Macro Definition screen then appears. Enter Name of Macro unless you are defining Macro Z. Macro Z is already named Automatic Log-On. For all other Macros, enter a descriptive name of twnety characters or less. The Macro name is added by the program to the Macro Directory and displayed on a Status Line when the Macro is sent.

To change the value of TIME-OUT or a Send Return prompt, use Left/Right arrow or enter directly.

For entries requiring data, type directly from the keyboard.

Protecting Your Macro Information

You may hide the contents of any Macro field by pressing the **Protect Key** when in the Macro field. The Macro field will then be replaced by ***PROTECTED*** whenever displayed on the screen or the printer. Once the Macro field is protected, it cannot be "unprotected." You may, however, press CTRL-X to cancel the field entry and reenter the data. Macros may be protected immediately after the entries are made or later after they have been tested.

During a communications session, Macro data is displayed on the screen in its unprotected form if the data is echoed by the remote data system.

The **Protect Key** is defined on the Parameter screen for each Communication Set.

Protecting Your Macro Field:

- 1. Create Macro in normal manner and test its operation.
- 2. While in the Macro data field, press the Protect Key.

Note: If you did not protect the Macro when you generated it, you may go back at any time and protect it.

The next section continues to guide you with Macro development.

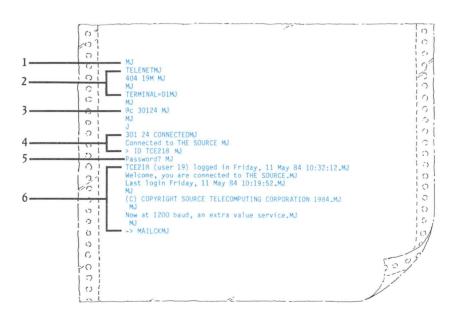
Using Printouts To Assist In Macro Development

Use the printout just generated during your on-line session to help you further with defining the Macro. For purposes of discussion, the illustration below uses the Telenet network to access THE SOURCE information service.

Printer Output

- Telenet Network requires two return characters to begin. (MJ represents control codes for return and line feed).
- 2. Network responds by identifying itself. Prompts you for your terminal type. Note that the last character displayed is the equal sign. This becomes the prompt character.
- 3. Next, the character "@" appears. The network is requesting the computer host system number.

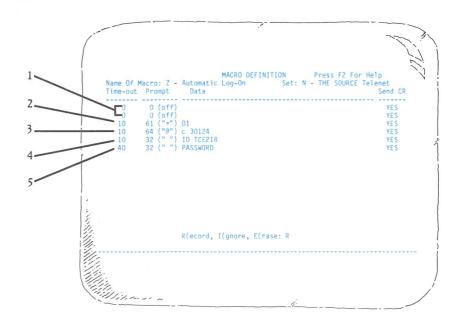
- Network verifies the number and identifies service to which you are connected (i.e., THE SOURCE). Prompts with > and space.
- 5. Requests password followed by "?" and a space.
- 6. The service responds with a "WELCOME" message.



Macro Definition Screen

- 1. Set Time-out to 0
 - Set Prompt to 0 (none)
 - Press return
 - Enter Y (YES) for Send CR
 - Repeat on the next line
- 2. Set Time-out (i.e., 10 seconds)
 - Set Prompt to "="
 - Enter D1 for Data, press return
 - Enter Y (YES) for Send CR
- Time-out remains
 seconds
 - Set Prompt to "@"
 - Enter the computer host system number for Data
 - Enter Y (YES) for Send CR

- 4. Time-out remains 10 seconds
 - Prompt set to "space"
 - Enter ID# for Data
 - Enter Y (YES) for Send CR
- 5. Set Time-out high to allow the service enough time to verify your ID# (i.e., 40 seconds)
 - Prompt set to a space
 - Enter your Password for DataEnter Y (YES) for Send CR



When you are finished defining your Macro, press the **Escape Key**. You are then prompted to **R(ecord, I(gnore, E(rase** the Macro you have just defined. Press **R** to record the new Macro to disk.

Note: Testing the utility of your newly defined Macro is discussed in Chapter 7, Troubleshooting.

Batch Command Sets

Definition: A Batch Command Set is similar to a Macro in that it consists of a set of recorded instructions used for communicating with an interactive remote data system. Smartcom provides a convenient way for assembling and recording Batch Command Sets (a series of keystrokes) for transmission at a specified time. A Batch Command Set may be as simple as "1OA" or as complex as logging on, sending a file, starting a regular macro, hanging up, and calling several other systems. For brevity, the Batch Command Set will hereafter be called Batch Set.

- You may record a maximum of 26 different Batch Sets (A-Z).
- The maximum number of keystrokes in any Batch Set is 500.
- If a drastic error occurs during a Batch Set playback, the procedure is aborted and the telephone hung up.
- A Batch Set Directory may be displayed via the main menu similar to Macros.
- In playback mode the defined **Escape Key** will abort a Batch Set at any time or cancel the wait for start time.
- Batch Set Z (if defined) will be executed when Smartcom starts up, i.e., when you run SCOM.
- Batch Sets may be chained (linked) for sequential execution.
- You may designate up to four sets of "override" prompts per Batch Set; this feature allows Smartcom II to recognize specific remote system prompts and respond with a set of predefined characters.

Viewing a Batch Set Directory

- STEP 1: From Smartcom II menu screen, press **2** to select EDIT SET.
- STEP 2: Press B for BATCH Select.
- STEP 3: The prompt line R(ecord, E(rase, P(layback, S(top Record: and the Batch Set Directory are displayed below the menu.
- STEP 4: Press **Escape Key** to return to main menu.

```
Hayes Microcomputer Products, Inc.
   Smartcom II
1. Begin Communication *. Receive File
2. Edit Set *. Send File
                                                7. Change Printer Status (OFF)
                                               *. Select Remote Access
3. Select File Command 6. Change Configuration 9. Display Disk Directory (ON)
                                               O. End Communication/Program
A,B - Change Drive
                        Press F2 For Help
Enter Selection: 2
                     P(arameters, M(acros, R(eports, C(opy, S(et, B(atch: B
R(ecord, E(rase, P(layback, *(top Record: R
                      Starts keystroke recording process
Batch Directory:
 A - COMPUSERVE WEATHER
 B - GET DOW JONES QUOTES
                                                       U -
 C - KI INFO ON UNIX
 D - PRINT MCI MAIL BOX
                                                       W -
 E - ATL; LAX VIA OAG
 F - READ SOURCE MAIL
                            0 -
                                                       X -
                            P -
 G -
                                                       7 - Automatic Startup
                            0 -
 H -
 I -
  15:57:57
                             Tuesday May 8, 1984
```

Procedures for recording, playing back (with and without delay), and erasing Batch Sets follow.

Recording Your Own Batch Sets

A few notes before you start:

- You will be recording your Batch Set on-line, thus enabling you to check out the Batch Set as you create it. Use an automatic log-on Macro, then record keystrokes on an interactive basis
- The process of referencing a Batch Set within another Batch Set is called "chaining." Chaining lets you connect two or more Batch Sets for sequential processing. The time spacing of chained Batch Sets is specified in the playback procedure.
- When recording Batch Sets, do not use the cursor control (arrow) keys for changing parameters; use direct entry keys instead.
- Type CTRL-X before entering a new telephone number or password on the parameter screen.
- When the prompt R)e-enter, A(ppend, E(rase appears, the answer A is always assumed.
- When the prompt R(e-enter, E(rase appears, the answer E is always assumed.
- When the prompt Retry Until Carrier appears, the answer Yes is always assumed. If there is no answer within ten retries, the Batch Set is aborted.
- If you press the defined Escape Key while Smartcom II is dialing, waiting for a response, sending files, or sending a Macro, the Batch Set recording is canceled. The message Batch Record Canceled! Press...to Continue is subsequently displayed.
- Refer to Batch Sets table in Chapter 7 for additional information.

To Record a Batch Set:

STEP 1: From Smartcom II menu screen, press 2 to select EDIT SET.

STEP 2: Press B to select BATCH processing.

STEP 3: The prompt line R(ecord, E(rase, P(layback, S(top Record: and the Batch Set Directory are displayed below the menu.

STEP 4: Press R to select recording procedure.

STEP 5: Enter the desired Batch Set label (A-Z).

STEP 6: The prompt for the name (20 characters) then appears, with the old name (if any) as the default. To keep the old name, simply push the Return Key. To change the name, use Backspace Key or CTRL-X to delete the name, then type in the new name and push the Return Key.

STEP 7: When the screen displays **Override Prompts:**, enter **N** if none are desired and proceed to Step 10. If you want to designate override prompts, enter **Y** and proceed to Step 8. (Refer to "Using Override Prompts" at the end of these steps for more details.)

STEP 8: Note: Use the up/down arrow keys to select the desired data field, CTRL-X to delete entries, and backspace key to edit entries. You may include control characters in the Prompt and Send fields by prefixing them with a caret (i.e. \land M for Return).

In the **Prompt** field, enter the sequence of characters which calls for a response. If there are more than eight characters, only use the last eight.

In the corresponding **Send** field, enter the override response (up to 20 characters). You may enter up to four prompt/send pairs.

STEP 9: Press the **Escape Key** to complete the override response sequence and begin the recording sequence.

Screen returns to main menu and shows progress prompt Recording Batch Set (A-Z) on the status line. At this point recording of keystrokes can begin.

STEP 10: Enter keystrokes (commands) of Batch Set on keyboard. (These are the Smartcom II commands which you wish to record for later playback).

STEP 11: When done, select menu option 2, EDIT SET.

STEP 12: Press B for BATCH Select.

STEP 13: The Prompt line R(ecord, E(rase, P(layback, S(top Record: is displayed below the menu.

STEP 14: Press **S** to **Stop Recording** process. The Batch Set name appears in the directory, indicating that your Batch Set is now recorded for future use.

Using Override Prompts

Batch Sets may be set up to recognize specific remote system prompts and respond with a set of predefined characters. You may specify up to four of these "override" prompts and responses per batch set. This feature allows you to handle variable situations which cannot be programmed into the Batch Set or Macros directly. For example, if the remote system sends —MORE— to prompt the user to press the Return Key for more text, a Batch Set override prompt can be set up to respond with the ASCII code for Return (\wedge M).

Playing Back Your Own Batch Sets

A few notes before you start:

- You may specify immediate playback or delay playback up to 24 hours.
- Time-out for Batch Sets is 15 seconds; i.e., Smartcom II continues with next command if there is no response from the remote system within 15 seconds.
- To abort the playback or cancel the wait for start time, simply press the defined ESCAPE key.
- When the prompt R(e-enter, A(ppend, E(rase appears, the answer A is always assumed.
- When the prompt R(e-enter, E(rase appears, the answer E always is assumed.

To Play A Batch Set:

- STEP 1: From Smartcom II menu screen, press 2 to select EDIT SET.
- STEP 2: Press B to Select BATCH processing.
- The prompt line R(ecord, E(rase, P(layback, S(top STEP 3: Record: and the Batch Set Directory are displayed below the menu
- STEP 4: Press P to select playback procedures.
- Enter the desired Batch Set label (A-Z). The prompt STEP 5: Start Time: appears.
- STEP 6: At this time you may elect to send the Batch Set immediately or enter a start time.

Press **Return Key** to send Batch Set immediately. or...

Enter the start time in 24-hour format (hh:mm) and press Return Key. (If you are using a CP/M-86 operating system, refer to notes following Step 8).

- STEP 7: The prompt: **BATCH SET STARTS IN HH:MM** appears below the main menu. When the countdown is finished, the Batch Set is started. To abort a Batch Set and cancel the countdown (if set), press the defined Escape Key.
- While the Batch Set playback is in progress, the STEP 8: prompt Playing Batch Set (A-Z) is displayed.

Note: If your system uses CP/M-86 instead of an MS-DOS operating system, you will be prompted to enter the current time. Enter the time in 24-hour format (hh:mm). Pressing the return key instead of entering a specific time enters 00:00.

If you use CP/M-86 and are chaining Batch Sets, the current time and the start time entered when the Batch Sets are recorded will be used at playback. The start time of the first Batch Set is absolute. The start time of subsequent Batch Sets is relative. To simplify time calculations for chained Batch Sets, enter the desired delay time when prompted to enter Start Time, and enter 00:00 when prompted for the Current Time. Thus, if you enter 2:00 for the start time and 00:00 for the current time, the chained batch set is played two hours after the previous Batch Set.

Erasing Your Batch Sets

STEP 1: From Smartcom II menu screen, press 2 to select EDIT SET.

STEP 2: Press B to select BATCH processing.

STEP 3: The prompt line R(ecord, E(rase, P(layback, S(top Record and the Batch Set Directory are displayed.

STEP 4: Press E to select erase mode.

STEP 5: Enter the label (A-Z) of the Batch Set which is to be erased.

STEP 6: Answer the erase prompt **OK? (Y/N)**: with Y. After the selected Batch Set is erased, Smartcom II returns to the main menu select options. In addition, the Batch Set name is erased from the directory.

Example of Single Batch Set:

To have your computer obtain stock quotes via THE SOURCE Telenet after 11 p.m., you could set up a Batch Set consisting of the following elements:

- STEP 1: From the Smartcom II main menu, press **2** to select EDIT SET.
- STEP 2: Press B for BATCH Select.
- STEP 3: The prompt line R(ecord, E(rase, P(layback, S(top Record and the Batch Set Directory are displayed below the menu.

Press R for Record function.

- STEP 4: Choose an unused label (A-Z) from the Batch Set Directory, say C. Press C key.
- STEP 5: Enter the name STOCK QUOTES when prompted.
- STEP 6: When the screen displays **Override Prompts**:, enter **Y**.
- STEP 7: In the **Prompt** field enter -MORE-. (This is the caption sent by THE SOURCE to indicate that more text is available for transmission; THE SOURCE will send another page of text upon receipt of **Return** (\land **M**).
- STEP 8: In the corresponding **Send** field, enter \wedge **M**.
- STEP 9: Press the **Escape Key** to complete the override response sequence and begin the recording sequence.

Smartcom II returns to menu screen and displays **Recording Batch Set C** on the status line. (Now recording of keystrokes begins).

STEP 10: Type 10N

(Begin communications, originate call, select Communication Set N, and send Automatic Log-on Macro Z).

Press **Printer Key**. (Turns on printer).

Using prompts from THE SOURCE, select the stock quotes, sign-off command, etc.

Press **Printer Key**. (Turns off printer).

Press **Escape Key**. (Smartcom returns to main menu).

Type 0 to hang up telephone.

At the prompt H(ang up, V(oice, E(xit program: enter H if you wish to hang up the telephone and continue using Smartcom.

Note: If you press **E**, recording of Batch Set C is automatically stopped and the Smartcom II program exited.

STEP 11: To finish the recording process:

Select menu option **2**, EDIT SET. Press **B** for BATCH SELECT. Press **S** to Stop Recording process.

STEP 12: The above Batch Set can be played back in the "immediate" mode or delayed by a specified time.

In either case, type 2BP plus the Batch Set label.

Press Return to send Batch Set immediately, or...

Enter the start time in 24-hour format (hh:mm) and press **Return**.

Example of Chained Batch Sets

To have your computer obtain the commodities news from DJN/R via Telenet at 11:00 p.m. and the CompuServe news headlines via CompuServe Network Service at 7:00 a.m., first record the Batch Set to be played last (news headlines). Then record the Batch Set for the commodities news and include a reference to the first Batch Set. Details follow:

STEP 1: From Smartcom II main menu, press **2** to select EDIT SET.

STEP 2: Press B for BATCH Select.

STEP 3: The prompt line R(ecord, E(rase, P(layback, S(top Record and the Batch Set Directory are displayed below the menu.

Press R for Record function.

STEP 4: Choose an unused label (A-Z) from the Batch Set Directory, say E. Press E key.

STEP 5: Enter the name NEWS HEADLINES when prompted.

STEP 6: When the screen displays **Override Prompts:**, enter N

Smartcom II returns to menu screen and displays **Recording Batch Set** on status line. (Now recording of keystrokes begins).

STEP 7: Type 10A

(Begin communications, originate call, select Communication Set A, CompuServe Network Service).

Press **Printer Key**. (Turns on printer).

Press Macro Prefix Key. then press I key. (The Macro Prefix Key enables macro selection, followed by Macro I which selects the News Headlines feature of the information service).

Press **Printer Key**. (Turns off printer)

Press **Escape Key**. (Smartcom returns to main menu).

Type 0 to hang up telephone.

At the prompt **H**(ang up, **V**(oice, **E**(xit program: enter **H** if you wish to hang up the telephone and continue using Smartcom.

Note: If you press **E**, recording of Batch Set I is automatically stopped and the Smartcom II program exited.

STEP 8: To finish the recording process of Batch Set E:

Select menu option 2, EDIT SET.

Press B for BATCH Select.

Press **S** to Stop Recording process and write Batch Set onto the disk.

STEP 9: Now the recording of the next Batch Set begins. From the Smartcom II main menu, press 2 to select EDIT SET.

STEP 10: Press B for BATCH Select.

STEP 11: The prompt line R(ecord, E(rase, P(layback, S(top Record and the Batch Set Directory are displayed below the menu.

Press R for Record function.

STEP 12: Choose an unused label (A-Z) from the Batch Set Directory, say D. Press **D** key.

STEP 13: Enter the name COMMODITIES NEWS when prompted.

STEP 14: When the screen displays **Override Prompts:**, enter N. Now recording of keystrokes begins.

STEP 15: Type **10D**(Begin communications, originate call, select Communication Set D. DJN/R Telenet).

Press **Printer Key**. (Turns on printer).

Press **Macro Prefix Key**. then press **D** key. (The **Macro Prefix Key** enables macro selection, followed by Macro D which selects the commodities news feature of the information service).

Press **Printer Key**. (Turns off printer).

Press **Escape Key**. (Smartcom returns to main menu).

Type 0 to hang up telephone.

At the prompt **H**(ang up, **V**(oice, **E**(xit program: enter **H** if you wish to hang up the telephone and continue using Smartcom.

Note: If you press **E**, recording of Batch Set D is automatically stopped and the Smartcom II program exited.

STEP 16: To chain Batch Set E to D:

Select menu option **2** EDIT SET. Press **B** for BATCH SELECT. Press **P** to select Playback function. Press **E** to select Batch Set E

STEP 17: When prompted **Start Time:**, enter **7:00**, the playback time of Batch Set E.

After the time is entered, recording of Batch Set D is automatically stopped.

STEP 18: To play Batch Set D at 11:00 p.m. (23:00), proceed as follows:

From the Smartcom II menu, type **2BPD**. (Play Batch Set D)

STEP 19: When prompted, enter the Start Time: 23:00 and press Return Key.

After Batch Set D has been played, countdown of Batch Set E begins automatically.

Additional Communication Set Commands

This section deals with the REPORT and COPY commands accessed through menu selection 2, EDIT SET.

The Reports Command

When you select R for REPORTS from the prompt

P(ARAMETERS, M(ACROS, R(EPORTS, C(OPY, S(ET, B(ATCH,

another prompt appears.

S(UMMARY, D(ETAILED REPORT:

distinguishes the two types of reports generated by Smartcom II.

The Detailed Report includes the parameter settings and all Macros for the currently selected Communication Set only. The same information that is displayed on the Parameters screen and the Macro Definition screen is shown on the report.

The Summary Report shows the name of the Set with the telephone number and the Macro Directory for twenty-five Communication Sets.

The Smartcom II disk contains parameter settings and predefined values for some of the Communication Sets. You may wish to print out this information for future reference.

The Copy Command

The COPY command allows you to duplicate an existing Communication Set into another existing Communication Set or an empty Communication Set. For example, you may communicate with a remote system that uses different telephone numbers for 300 bps and 1200 bps service. You may define one Communication Set with a telephone number, baud rate, Macros, and other parameters, then copy it to another Communication Set entry via the COPY command. After the copy is completed, use the SELECT SET command to access the duplicate Communication Set. Next, select **P** from the subprompt to display the Parameters screen. Change the Set name, baud rate, and telephone number to obtain a distinct Communication Set for the second number of the remote system.

Storing Communication Sets

Smartcom II stores the system configuration and Communication Set data in one file on your disk. This information is read by the program and processed when the program first starts up and when a new Communication Set is selected.

The changes that you make to the system configuration or a Communication Set are not automatically recorded in the data file. The last question on the Parameters and Macro Definition screens allows you to decide if the changes made are to be permanent (i.e., recorded to the data file) or temporary. Temporary changes are lost when you end the program. Changes made to a Communication Set are lost when a new Set is selected, unless they are recorded to disk.

Different questions are posed on the Parameters and Macro Definition screens to determine if the changes will be stored. (The question on the Parameters screen is identical to that of the Configuration screen mentioned earlier). Both questions are described below.

Screen	Prompt	Action by Program
Parameters and	Record to Disk? (Y/N):	Y-Changes are permanent. Data file is updated.
Configuration		N-Changes are temporarily stored in memory. Changes to the Parameters screen are lost when another Communication Set is selected or when the program is terminated. Changes to the configuration screen remain in effect until the program is terminated.
Macro Definition	R(ecord, I(gnore, E(rase	R-Changes are permanent
		I-Data file is unchanged: changes just made do not take effect.
		E -Erases Macro from data file.

"Erasing" Communication Sets

Use the COPY command and Communication Set **Z**. Standard Values, to erase an existing Communication Set. Since Set **Z** does not contain any Macros, copying this Set serves to "erase" those Macros previously defined. The parameters for the other Set are returned to the standard values.

Example for erasing Communication Set P:

STEP 1: From Smartcom II menu screen, press 2 to EDIT SET.

STEP 2: Press C to select COPY function.

STEP 3: Smartcom displays Copy Set:

Enter **Z** (label of Communication Set to be copied).

STEP 4: Smartcom displays **To Set:** Enter **P** (label Communication Set to be erased).

STEP 5: Smartcom displays **OK?** (N/Y): Enter Y to start erasing.

Erasing Macros does not automatically reduce the size of the data file. However, if you erase enough Macros to free 6K (6144 bytes) of space in the file, the following question appears the next time you start the program.

SCOM.DAT Has 6K Of Unused Space Because Of Erased Macros. Do You Want To Compress The Data File? (Y/N):

If you answer YES, the program compresses the file. When the data file is compressed, data is moved so that all available space is contiguous, thus making the file smaller. However, this process may take some time. If you do not need the space and do not wish to wait, answer NO.

Caution: To compress the data file, a copy of the existing file is made, eliminating the erased Mcros, and placed elsewhere on the disk. Therefore, you must have free space available *on the same disk*, equal to the size of the newly compressed data file.

Incorporating Smartcom II to Meet Your Business Needs

If your company purchased several copies of Smartcom II for use throughout your facility, you may expedite start-up time by defining the Communication Sets once and reproducing them for each location (provided that the same remote systems will be contacted).

Caution: Be sure to observe copyright restrictions stated in the User Support Information section at the end of this manual.

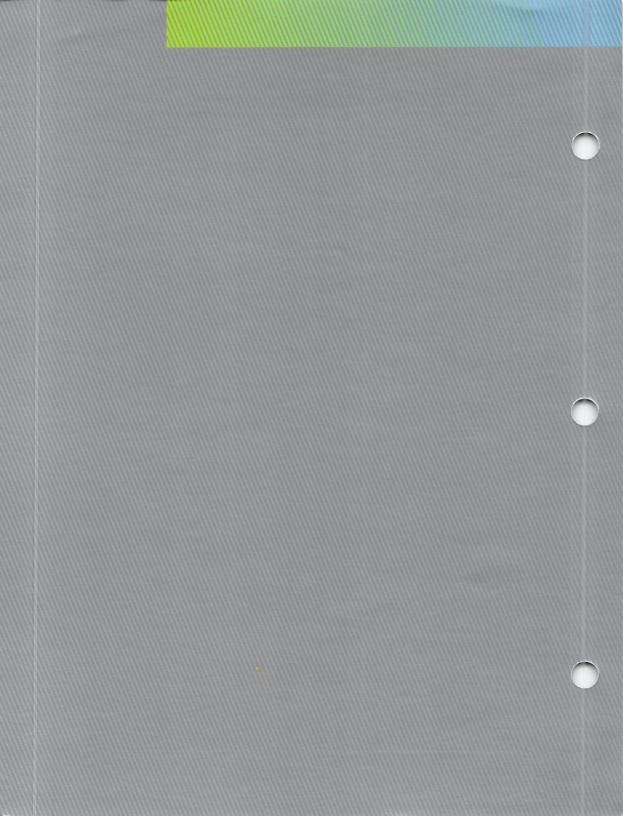
Create and test on one Smartcom II disk all of the Communication Sets required for your particular organization. All of the Parameters, Macros, and system Configuration data is stored in the data file named SCOM.DAT.

Next, exit the program and transfer the data file to all of the other Smartcom II disks using a copy program provided by the operating system. You are not permitted to enter the file name SCOM.DAT while Smartcom II is running.

Be sure to name all of the duplicate files SCOM.DAT when copying the file. The program recognizes this name *only* for the data file. The file copied replaces the original data file on each disk.

File Management

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Chapter Objectives

This chapter focuses on commands that manage your files and on concepts related to transferring text files from your system to a remote system and vice versa. As you progress, try to achieve the following objectives.

- Become acquainted with computer files
- Recognize the importance of good file names
- Learn to categorize files according to the appropriate transfer protocols
- Learn to execute Smartcom II file commands
- Understand the difference between the types of transfer protocols used by Smartcom II
- Pinpoint information about the remote system that ensures compatible file transfer
- Send and receive a file using the Stop/Start Protocol
- Send files with the Send Lines Protocol.

Files

Definition: A file is a collection of information, stored on a disk, which may be accessed by a file name.

The types of files which can be transferred with Smartcom II depend on the computer you are communicating with and the software it uses. If the remote computer is running Smartcom II, you can transfer, using the Hayes Verification Protocol, any kind of file that your personal computer is capable of generating. If the remote system uses an XMODEM-compatible program, you can transfer files using the XMODEM protocol. If the remote system is not running Smartcom II, you can transfer files that are in pure ASCII form. Protocols used for remote access operations are discussed in Chapter 6.

More than one file may be contained on a single disk; therefore, it is important to select file names carefully. When you select 9. DISPLAY DISK DIRECTORY, from the Smartcom II menu, the names of all files on the current disk are displayed in alphabetical order.

```
Haves Microcomputer Products, Inc.
   Smartcom II
1. Begin Communication *. Receive File 2. Edit Set *. Send File
                                                        7. Change Printer Status (OFF)
2. Edit Set *. Send File *. Select Remote Access (OFF 3. Select File Command 6. Change Configuration 9. Display Disk Directory (ON)
                                                        O. End Communication/Program
A,B - Change Drive
                            Press F2 For Help
Enter Selection: 9
         Turns file directory display ON and OFF for selected disk drive
Directory Of Disk A:
                                           SCOM, CRT
                                                              SCOM_DAT
                                                                                SCOM.EXE
                        SCOM.CMD
    HAYES.TXT
                        SCOM.OVR
                                        SCOMFIX.EXE
     SCOM.HLP
```

16:01:37

Tuesday May 8, 1984

Naming

Select a meaningful name for a file so that the name is a valuable reference. A file name may consist of three parts: the BODY, the DIVIDER, and the EXTENSION.

Body—Use to distinguish file con- tents; may be eight characters long ————	VC80.EXE
Divider—A period that separates the body of the file name from the extension———————————————————————————————————	
Extension—Indicates file type, such as BAK = Backup File.————————————————————————————————————	

The operating system uses extensions between types of files such as text files (TXT), command files (CMD), and executable files (EXE). The extension determines how a file is used by the computer and Smartcom II. Extensions also help decide which transfer protocol should be used with a particular file. (Transfer protocols are discussed later in this chapter).

When entering a file name, you may precede it with a letter designating the disk drive where the file is located (e.g., A:VC80.EXE). Smartcom II allows the use of up to sixteen disk drives, labeled A-P. (The disk drives available must be entered on the Configuration screen.)

When you do not precede the file name with a disk drive designation, the program assumes that the file is located on the currently selected disk drive. To instruct the program to refer to another drive, the letter of the drive must be entered.

You may also use the arrow keys to choose a file in the file directory. Refer to the special key descriptions in Chapter 1.

File Commands

Types

Smartcom II performs five file maintenance commands accessed through menu option 3, SELECT FILE COMMANDS. When you select 3, the program displays the prompt:

C(reate, D(isplay, P(rint, R(ename, E(rase.

Select a command by entering the first letter of the word. The prompt **Enter File Name** then appears. After you type the name of your file, press Return.

The error message *Reserved File Name* indicates that you have entered a file name reserved for system use. To proceed, enter another name.

Create File

Select **C** to create a file. If you then enter a file name already in use, the following prompt appears:

*File Exists * R(e-enter, E(rase, A(ppend.

Select **R** to return to the prompt **Enter File Name** and enter a different name.

Select **E** to erase the existing file that bears this name. You may then create a new file with this name by entering text that replaces the existing file.

Select A to add text to the end of an existing file. Smartcom II automatically searchs the last sector of the file for the last text character entered and includes the new text after that point.

Use the following keys to edit the file, while you are creating it.

↑ \(\sqrt{\text{Up/Down Arrow}}\)	Moves the cursor to the previous/
	subsequent line. Movement is limited
	to the lines of text in memory.

Deletes the line on which the cursor CTRL-U. CTRL-X

is positioned.

Backspace, CTRL-H. Moves the cursor back one space to ← (Left Arrow) erase the previous character.

When the amount of text entered becomes greater than the amount of memory available for buffering data, Smartcom II records the information onto disk. While the information is being written on disk, you may continue to enter text; however, the characters you enter do not appear on your screen until the program has finished writing. The writing is accomplished in a matter of seconds. Once recorded on disk, the data may not be edited.

To become familiar with creating a file, follow the steps described below. You will create a message to be sent to the Customer Service Department at Hayes Microcomputer Products, Inc. via THE SOURCE and CompuServe Information Service.

Creating your HAYES File

STEP 1: Select menu option 3, SELECT FILE COMMAND.

STEP 2: Select C for CREATE file.

STEP 3: So that you can follow the example, enter the file name **HAYES.TXT** and press return.

STEP 4: Enter the text of your message. (Please comment on Smartcom II!)

STEP 5: When you have completed your message, press return to move the cursor to the next blank line.

STEP 6: Type .S. (.S is an electronic mail command that sends your message through THE SOURCE mail system to Hayes' mailbox when the file is sent.)

STEP 7: When you have finished, press the **Escape Key** to close the file and redisplay the menu.

Dear Customer Service,

I recently purchased your new communications software, Smartcom II, and am very pleased with its capabilities. I find the User's Manual informational and easy to use. The ability to communicate with national information services indicates that Hayes is aware of public needs. I look forward to future products from Hayes.

Thanks again for this opportunity to respond,
Connie Stockdale
Atlanta, GA

. 5

Your new file is now located on disk. Later in this chapter you will send this file to Hayes' mailbox.

Display File

The DISPLAY command enables you to review a file at any time, at your own pace.

If after selecting this command, the message *File Not Found* appears, check the spelling of the name you entered and check that you entered the correct disk drive letter.

The first twenty-two lines of the file (twenty-four, if **Show Status Lines** is set to NO) are then displayed on the screen. Press the space bar to display the next twenty-two lines. You may discontinue the display at any time by pressing the **Escape Key**.

Print File

The PRINT command sends a file to the printer instead of the screen. The file is sent continuously, rather than in twenty-two or twenty-four line portions. Set **Character Processing** in PARAMETERS screen of the applicable Communication Set to FORMATTED to ensure that output is properly printed on each page.

Smartcom II uses the Form Feed method of spacing between pages and at the end of the PRINT command.

Rename File

The RENAME command prompts you for both the current name of the file you wish to change, followed by the new name that you have chosen. When the file is renamed, the new name replaces the old name in the Disk Directory.

```
Smartcom II
                          Hayes Microcomputer Products, Inc.
1. Begin Communication *. Receive File
2. Edit Set *. Send File
                                              7. Change Printer Status (OFF)
                                              *. Select Remote Access
3. Select File Command 6. Change Configuration 9. Display Disk Directory (ON)
A,B - Change Drive
                                              O. End Communication/Program
                       Press F2 For Help
Enter Selection: 3
                      C(reate, D(isplay, P(rint, R(ename, E(rase: R
Enter Old Filename: A:HAYES.TXT
Enter New Filename: A:SMARTCOM.TXT
Directory Of Disk A:
   HAYES.TXT
                  SCOM.CMD
                                   SCOM.CRT
                                                   SCOM.DAT
                                                                    SCOM.EXE
                  SCOM.OVR SCOMFIX.EXE
                                                   TRASH
    SCOM.HLP
```

If the message *File Not Found* appears when you enter the old file name, check the spelling of the name and the disk drive entered. When the message *File Is Read Only* appears beside the old name, Smartcom II is indicating that the file may be read but not altered in any way. (A file is made a "read only" file by an operating system command.)

If the message *File Exists* appears beside the new name, you have chosen a name already in use in the Disk Directory. Select another name.

Erase File

Remove unwanted files and free valuable disk space by using the ERASE file command.

This command prompts you for the name of the file you wish to erase and then allows you to check that the name is correct before it permanently removes the file.

The message *File Is Read Only* indicates that the file may be read but not erased with Smartcom II. (A file is made a "read only" file by an operating system command.)

An entire collection of similar files, such as backup files, may be erased in one command by entering "wild cards" in the file name. Use the asterisk to represent either the body or the extension of the name.

Example: *.BAK

While erasing the files, if Smartcom II encounters a reserved file name or read only file, the particular file is ignored and the process continues.

If the message *File Not Found* appears, check the spelling of the file name and the disk drive designation.

File Transfer Protocols

Definition: A file transfer protocol is a process that helps two devices to interact without error for the purpose of transferring data.

If, for example, your system is unable to process incoming information at the same rate as it is being sent by a remote system, employ a protocol to maintain communication. Or, if you need to transfer data with a high degree of accuracy, employ an error-free protocol.

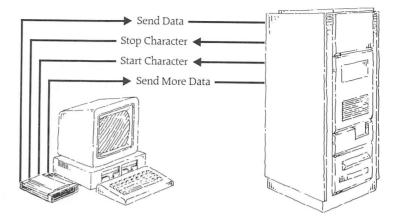
Protocol Types: When using menu option 4. RECEIVE FILE, or menu option 5. SEND FILE, Smartcom II supports three different protocols: Stop/Start, Send Lines, and Error-Free. The Error-Free protocol further is divided into the Hayes Verification and X-MODEM protocols.

- The Stop/Start and Send Lines protocols are used for transferring text files.
- The Error-Free protocols are used for transferring program or code files with extensions such as .CMD, .COM, or .EXE between systems.

Stop/Start Protocol

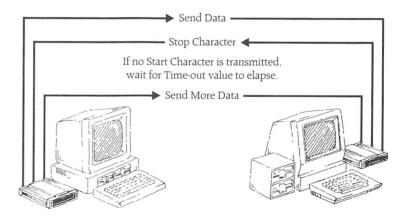
The Stop/Start Protocol allows the recipient of a file to stop and start the transfer by transmitting a **Stop Character** and a **Start Character**. These characters *must* match those used by a remote system for this purpose. Typically, CTRL-S (DC3) is transmitted to temporarily stop the transfer; CTRL-Q (DC1) restarts it.

Transmission of Data with Stop/Start Protocol



While sending a file. Smartcom II monitors the line for an incoming **Stop Character**. If received, the program immediately stops sending characters and waits for an incoming **Start Character** or for a predetermined **Send Time-out** value to elapse before continuing the transmission of characters.

Transmission of Data with Send Time-out in Effect



When receiving a file, Smartcom II also controls the transfer with the Stop Character and Start Character. When the memory space or buffer allocated for information received becomes 100% full (as indicated on the Status Lines beside the file name) Smartcom II sends a Stop Character to the remote system. Data is received until a half second of idle time elapses or until data is recorded on disk. If any data is sent by the remote system while the data is being transferred from memory to disk, this information could be lost. If this occurs, question marks appear among the text on your screen and asterisks replace the percentage value of received data on the upper status line. This may occur if you have failed to select the correct Stop Character or if the character was lost or distorted in transmission. When all data is recorded, a Start Character is issued and transmission resumes.

Should the transmission of data stop, the Receive Time-out parameter is applied. If the predetermined Receive Time-out elapses before additional data is received, the file is closed.

Send Lines Protocol

Some remote computer systems, such as bulletin boards, are not capable of accepting several lines of text at one time; they must process incoming data on a line by line basis. A line usually consists of a predetermined maximum number of characters or all characters up to and including an EOL Character (end of line). Some systems transmit a specific character to prompt for or to indicate that they are ready to receive a line of data.

Use the Send Lines Protocol to accommodate both types of systems. When a Prompt Character is received, Smartcom II begins to send data and checks each character to be sent until the EOL Character is found. The program then stops sending data until one of the following occurs:

- 1. the Prompt Character is received from the remote computer,
- 2. the Send Time-out has elapsed, or
- 3. you press any key, forcing the file transfer to resume immediately.

If you encounter problems while sending text files, refer to Chapter 7, Troubleshooting, for additional help.

Error-Free Protocols

Error-free transmission can take place only when both sender and receiver are using the same error-free protocol.

- Use the Hayes Verification Protocol for error-free communication between Hayes programs or Hayes-compatible programs such as M.I.T.E. (Mycroft Labs, Inc.).
- Use the X-MODEM Protocol for error-free communication between Hayes programs and X-MODEM-compatible programs such as PC-TALK or CROSSTALK.

It is very important to use only an Error-Free protocol when transferring program or code files to prevent loss of data bits. The loss of even one bit of a code or program file could result in total malfunction of the file.

Selection of File Transfer Protocols: After you establish communications with another system and select either 4. Receive File or 5. Send File. you are prompted to choose one of three protocols: Stop/Start, Send Lines, or Error-Free. If you choose the latter, the error-free protocol selected under the Protocol Parameters category in the currently selected PARAMETERS set will be used for the file transfer action. Therefore, you need to select a convenient PARAMETERS set and choose the required error-free protocol before beginning communication.

More Protocol Details...

The various protocols are discussed further in Chapter 6 Communicating with Other Computers, since most information services don't support error-free protocols.

Communication Methods

File transfer between your computer and a time-shared remote system only involves transfer of digital data; i.e., the operators do not speak with each other to coordinate the process. File and data transfer between non-timeshared systems (personal computers and minicomputers) can take place in the same manner or the operators can speak with each other to coordinate the process, then switch to a digital data transfer process. The rest of this chapter is about the digital data transfer process.

The method for changing from voice to data and vice versa is discussed in Chapter 6.

Checklist for Transferring Files

Below is a checklist to follow when transferring files. To achieve a smoother transfer, gather this information before beginning.

The examples below examine the transfer process to and from services, accessed through national networks, using the Stop/Start and Send Lines Protocols. Does the file you wish If so, use the Stop/Start or Send Lines to transfer contain Protocol. If not, refer to Chapter 6 for only human readable information on Error-Free Protocols. text? (Control characters may not be included.) Does the remote If so, use the Stop/Start Protocol. system use specific Values for the Stop Character and Start Character may be changed to characters for match those of the remote system. stopping and starting file transmission? If so, the Send Lines Protocol is best Does the remote used for the transfer. system a) individually process each line of received text and/or b) transmit a specific prompt character when it is ready to receive data? Both Smartcom II and the remote sys-Do you want to transfer in full or half tem must have same **Duplex** setting. duplex?

What kind of Charac- ter Processing should be used?	The FORMATTED setting causes Smartcom II to process incoming data for undesirable control characters.
	The DIRECT setting causes the incoming data to be recorded on disk exactly as it is received.
Do you want the incoming data to remain temporarily Confidential by not displaying it on the screen?	If so, the data is not displayed during the transfer, but may be printed or displayed at a later time.
Does the remote system include line feeds after each carriage return?	If not, set the parameter Include Line Feeds to YES to ensure that there is one line feed following each carriage return.
Do you need a Character Delay to enable the remote system to process characters received from your system at the specified rate?	Some devices are unable to handle a continuous stream of characters, especially at 1200 bps.
Should Line Delay be adjusted to assist the remote system in processing text received from your system?	Similar to Character Delay , this parameter provides the remote system with processing time after each carriage return received.
To what value should Receive Time-Out be set?	Establish the amount of time that may elapse before the program closes the received file. This parameter should be set high enough to ensure that the file is not closed before transmission is complete, but low enough so that there is little unnecessary waiting.

What is the proper setting for Send Time-Out ?	Determine the amount of time that may elapse before additional data is sent. This parameter should be set high enough to allow a remote system time enough to record onto disk characters received in memory, but low enough so that time is not wasted waiting for a Prompt Character lost in transit.
If using the Stop/Start Protocol, what specific stop/start characters are used?	Your Stop Character and Start Character MUST match those of the remote system.
What character will you use to signify the end of the line?	This is used only with the Send Lines Protocol. The EOL Character signifies the end of a portion of text being sent. It is normally set to a return or a line feed character.
What Prompt Character does the remote system use when it is ready to accept another line of data?	This is also used only with Send Lines Protocol. The Prompt Character must be set to equal the last character (including a space) received from a remote system.

Once you have secured the information described on the checklist, you are ready to begin transferring text files via the Stop/Start or Send Lines Protocol.

Disk Drive Selection

In Chapter 2 you defined the available disk drives in your system. Remember the Available Disk Drives: entry in the CON-FIGURATION screen? When you send or receive files, you can specify any of those disk drives for file transfer purposes. In two-drive systems, the Smartcom II disk is normally located in drive A and a second disk in drive B. To send a file from drive B. you can proceed in two ways:

- 1. From the main menu, enter the letter of the desired drive, in this case B. Then, until specified otherwise, all file send or receive functions will pertain to drive B.
- 2. Specify the disk drive whenever you are asked to enter a file name. This is done by using the designation of the drive, followed by a colon. For example, when you are prompted to Enter File Name: in the Send File mode, entering B:HAYES.TXT will specify the file named HAYES.TXT in drive B.

You may also change drives while on-line with another system: however, do so only when files are closed and no files are being transmitted.

Notice: Although Hayes has attempted to verify the accuracy of the following examples concerning information services that you may be able to access using Smartcom II. Hayes does not warrant and assumes no responsibility for the accuracy of the examples. The information services may make changes in their internal systems which would result in the temporary inability of a Smartcom II user to access the service using the procedure set forth in these examples. Example parameter values included in Smartcom II may be modified to accommodate changes made by the services. These examples are included in the Owner's Manual to demonstrate the ability of Smartcom II to communicate with such systems and to provide valuable information to the purchasers of Smartcom II.

Sending Text Files Via Stop/Start Protocol

Earlier in this chapter, you created a text file named HAYES.TXT containing a message for the Customer Service Department at Hayes Microcomputer Products, Inc. Now you are going to send this file using the electronic mail system on THE SOURCE information service. This example assumes that you have obtained your own ID Number and password and entered both in the Automatic Log-on Macro.

Prior to sending a text file, display the PARAMETERS of the selected Communication Set and set **Show Status Lines** to YES and **Character Processing** to FORMATTED. (DIRECT **Character Processing** should be used only when you wish to include control codes in the file.)

Example: Sending Your Hayes file to THE SOURCE via Stop/Start Protocol

STEP 1: Log-on to THE SOURCE using the predefined Communication Set. Enter 1 for BEGIN COMMUNI-CATION, 0 for ORIGINATE, and select the Communication Set you wish to use (Telenet, UNINET, Sourcenet, or Datapac) to contact THE SOURCE.

Macro **Z**, **Automatic Log-on**, logs you on to THE SOURCE. THE SOURCE menu then appears.

- STEP 2: Activate the Send Mail Macro. Press the Macro Prefix Key followed by the label W for the Macro named "Send Mail."
- STEP 3: THE SOURCE responds. Notice the Hayes ID, (TCE218), sent in response to THE SOURCE prompt TO: To send mail to another user through this Macro, change the ID Number.
- STEP 4: Next you are prompted for **SUBJECT:**. The general subject matter of your file (message to Hayes) has been included in the Macro.
- STEP 5: THE SOURCE responds with prompt **ENTER TEXT**:. The following sequence appears on your screen:

- STEP 6: Press the **Escape Key** to redisplay the Smartcom II menu.
- STEP 7: Select menu option 5, SEND FILE.
- STEP 8: When you are asked to select the desired protocol, enter 2. Stop/Start.
- STEP 9: When you are prompted for the file name, enter **HAYES.TXT**.
- STEP 10: The menu screen then disappears, the on-line screen appears momentarily, and then the transfer automatically begins.

STEP 11: When THE SOURCE receives .S in your message, you are asked to wait while the file is sent to Hayes' mailbox. Then. THE SOURCE verifies delivery by displaying the ID Number:

Enter text: Dear Customer Service,

I recently purchased your new communications software, Smartcom II, and am very pleased with its capabilities. I find the user's manual informational and easy to use. The ability to communicate with national information services indicates that Hayes is aware of public needs. I look forward to future products from Hayes.

Thanks again for this opportunity to respond,
Connie Stockdale
Atlanta, GA

.s Wait...

Sent to - TCE218

After you receive THE SOURCE prompt:

(S)end, (R)ead, (SC)an, (D)isplay, or (Q)uit?

Enter Q. followed by a Return, to produce THE SOURCE prompt, \rightarrow .

- STEP 12: Type **OFF**, followed by a Return, to exit from THE SOURCE.
- STEP 13: Press the **Escape Key** to redisplay the Smartcom II menu.
- STEP 14: Enter **0**, END COMMUNICATION to disconnect from the communication network.
- STEP 15: At the prompt **H(ang up, V(oice, E(xit program:** enter **H** if you wish to hang up the telephone and continue using Smartcom.

Example: Sending Your Hayes File to CompuServe via Stop/Start Protocol The CompuServe Information Service also has an electronic mail service. Assuming that you have obtained a User Identification Number and password and entered both in the Automatic Log-on Macro, you may now send the message you created for Hayes' Customer Service Department via CompuServe and Smartcom II using the following example.

STEP 1: Allow Smartcom II to log you on to CompuServe. Enter 1, BEGIN COMMUNICATION, 0, ORIGINATE, and select the Communication Set predefined for CompuServe. The CompuServe main menu appears. (If the CompuServe menu does *not* appear, but the prompt OK does appear, type R DISPLAY).

! 1

New file Z99EMA.TMP created - ready

Dear Customer Service,

I recently purchased your new communications software, Smartcom II, and am very pleased with its capabilities. I find the user's manual informational and easy to use. The ability to communicate with national information services indicates that Hayes is aware of public needs. I look forward to future products from Hayes.

Thanks again for this opportunity to respond,
Connie Stockdale
Atlanta, GA

/EX ---A:HAYES.TXT------CompuServe Send Complete 13 lines 12:55:46 Wednesday May 9, 1984

- STEP 2: Activate the Macro predefined for CompuServe Electronic Mail. press the Macro Prefix key followed by the label W for the Send Mail Macro.
- STEP 3: When the message appears "New file (Name) created-ready." press the **Escape Key** to return to the Smartcom II menu.
- STEP 4: Select menu option 5, SEND FILE.
- STEP 5: Select protocol **2**, Stop/Start. Enter the file name HAYES.TXT.
- STEP 6: To store this file in the CompuServe workspace, type the CompuServe command /EX on a new line followed by a Return.* The command /EX may be included at the end of your text file or entered after the file has been transferred.

STEP 7: The Electronic Mail Menu #2 reappears. Choose item 6, SEND Message From Workspace.

STEP 8: The following screen then appears.

Enter the pertinent information, including Hayes' ID number, which is **70271,137**.

- STEP 9: When you receive the prompt **Key < ENTER > To Continue**, type **T** for top to exit the Electronic Mail process and redisplay the CompuServe main menu.
- STEP 10: Type BYE at the prompt! to exit CompuServe.
- STEP 11: Press your **Escape Key** to produce the Smartcom II menu.
- STEP 12: Select 0, END COMMUNICATION.
- STEP 13: At the prompt **H**(ang up, **V**(oice, **E**(xit program: enter **H** if you wish to hang up the telephone and continue using Smartcom.

*Note: You were not instructed to include the CompuServe command /EX, which activates the sending process, in your HAYES file. The Source Command .S, which performs a similar process, was instead included to illustrate that such a command can be placed in the file. To use the same HAYES file, you must manually enter the CompuServe command /EX. CompuServe considers the .S to be normal data in the text file.

Receiving Text Files Via Stop/Start Protocol

To receive text files from a system not running a Hayes program, use the Stop/Start Protocol. There are two ways to receive a file: 1) select menu option 4, RECEIVE FILE, from the Smartcom II menu or 2) use the **Capture Key**. We will examine the former method first.

For the purpose of demonstration, receive information from the Dow Jones News/Retrieval Information Service, by activating the predefined Dow Jones Communication Set which you updated earlier to include your password and local network telephone number.

Example: Receiving From Dow Jones News/Retrieval Service Assuming that you have obtained an account and password and entered both in the Automatic Log-on Macro, you are ready to receive information from the Dow Jones News/Retrieval Service.

- STEP 1: Select 1, BEGIN COMMUNICATION, and 0, to ORIGINATE the call. Enter the label corresponding to the desired Dow Jones Communication Set. Macro Z, Automatic Log-on is immediately activated.
- STEP 2: Once connection is made, press the **Escape Key** to display the Smartcom II menu.
- STEP 3: Select menu option 4, RECEIVE FILE.
- STEP 4: When prompted for a protocol, select 2, Stop/Start.
- STEP 5: Next, you are asked to enter a file name. Since you will receive data from Dow's closing stock prices and quotes data base you might name your file STOCKS.TXT.

STEP 6: The menu disappears: the program is ready to receive data. Press your **Macro Prefix Key** followed by the label I for "Portfolio Prices." This Macro has been predefined to summon Dow Jones Quotes Data Base.

Text is received from Dow Jones and recorded on disk.

```
ENTER OUERY
   ,XON TAN DEC AAPL ADD
DOW JONES STOCK QUOTE REPORTER SERVICE.
STOCK QUOTES DELAYED OVER 15 MINUTES
*=CLOSE PRICE ADJUSTED FOR EX-DIVIDEND
STOCK
           BID
                     ASKED
                                                             VOL(100'S)
          CLOSE
                              HIGH
                                         LOW
                                                   LAST
                                                             509
          42 1/8
XON
                                                             509
          31 1/8
TAN
          92 3/8
DEC
                                                              18081
          33
                    33 1/8
AAPI
                                                              509
ADD
          41 1/8
   .AMN AWKC ASC ASZ DAL
STOCK
           BID
                     ASKED
                                                              VOL(100'S)
                              HIGH
                                         LOW
                                                   LAST
          CLOSE
                    OPEN
                                                              507
          28 7/8
          38 7/8
AWKC
                                               -Macro: Portfolio Prices-----
 Send Macro: Press F1 To Cancel
```

- STEP 7: Once you have received the desired text, press the **Escape Key** or wait for the **Receive Time-out** to elapse to end the receiving process.
- STEP 8: The data remaining in memory is recorded to disk and the file is closed. The Smartcom II menu reappears so that you may enter another selection.

Receiving with The Capture Key

The second method of receiving a file involves the use of the Capture Key. While on-line, the Capture Key that you have defined is displayed on the Status Line, following the message "Disk."

The following examples explain the use of the Capture Key.

Capture Key Scenario SITUATION: You are on-line to the UPI news service of an

information utility. Late breaking news items are coming across your screen. Suddenly, you see an interesting article that you would like to

save on disk.

ACTION: Press the Capture Key to seize the incoming

information.

SITUATION: You reach the end of the article that you are

saving.

ACTION: Again press the **Capture Key** to stop saving the

data.

SITUATION: Another article appears that you also wish to

store on disk.

ACTION: Press the **Capture Key** to seize the incoming

information. This data is added to the end of

the previously saved article.

SITUATION: These two articles are all that you wish to save

at this time.

ACTION: Press the **Escape Key** to terminate the capture

process.

SITUATION:

The message Rename File Received A:TEMP

appears.

ACTION:

1) enter a different name (e.g., Articles.TXT) for the TEMP file and press return.

2) If you do *not* enter a different name, press Return. (Data remains in a file called TEMP; on-

line screen remains displayed.)

3) Press the Escape Key to retain the file name TEMP and redisplay the Smartcom II menu.

Using the Capture Key Again

SITUATION:

You return to the UPI wire service for information. An article of interest appears that you wish to keep.

ACTION:

Press the Capture Key to record the information on your disk.

If you renamed the file described above, the new information becomes the file named TEMP and the previous file is undisturbed.

If, however, you chose *not* to rename your file at that time, this new data is recorded in place of what is already stored under the file name

TEMP.

Differences in Receiving a File with Menu Option 4 and the CAPTURE KEY

When receiving data to disk, Smartcom II must have a file name to associate with the incoming data. When you select menu option 4. RECEIVE FILE, the file name is entered before the process begins. If you enter a file name that already exists on disk, Smartcom II gives you the option to append the new data to the end of the existing file.

With the use of the Capture Key to activate the receive file process, the file name TEMP is only intended to be used temporarily. When you end the receive file process, you may change the file name from TEMP to a more meaningful one. If you choose not to change the name, new data is recorded in place of the information already stored there. The file name TEMP is always created as a new file each time the option is activated. Hence, new data is *not* appended to the existing TEMP file.

Sending Files Via Send Lines Protocol

Occasionally, you may encounter a remote computer system capable of accepting only one line of input at a time. Many 'bulletin boards and university computers use editors that output a particular character each time the system is ready to receive a line of input. Use the Send Lines Protocol to transfer a file to such systems. Be sure to set correctly the appropriate parameters (Prompt Character, End of Line Character, Send Time-out).

An example of transferring information to a bulletin board is provided. Contact your local computer store for a bulletin board in your area, and examine its text entry procedure to determine if the Send Lines Protocol may be used successfully to transfer your file.

Example: Transferring Information to a Bulletin Board Using Send Lines

- STEP 1: Select 1. BEGIN COMMUNICATION, AND **0** to ORIGINATE the call. Select the label of the Communication Set for the bulletin board you wish to contact.
- STEP 2: Determine the process to access the bulletin board function which accepts text input.
- STEP 3: Select the applicable parameters screen and set the Show-Control codes entry to on.
- STEP 4: Examine the incoming text to determine what character the bulletin board uses to prompt for input. The **Prompt Character** is the *last* character (including a space!) received from the bulletin board before it begins to wait for data.

If the **Prompt Character** changes or is lost in transmission, rely on **Send Time-out** to control the transfer. Set the time-out value to ten seconds.

- STEP 5: When the remote system prompts for input, press the **Escape Key** to display the Smartcom II menu.
- STEP 6: Select option 5, SEND FILE.
- STEP 7: Select the Send Lines Protocol, option 3.

```
Hayes Microcomputer Products, Inc.
   Smartcom II
                                                    7. Change Printer Status (OFF)
*. Begin Communication 4. Receive File
2. Edit Set 5. Send File 3. Select Remote Access (OFF 3. Select File Command *. Change Configuration 9. Display Disk Directory (ON)
                                                    O. End Communication/Program
A,B - Change Drive
                          Press F2 For Help
Enter Selection: 5
                         1) Error-Free, 2) Stop/Start, 3) Send Lines
Select Protocol: 3
Enter File Name: A: HAYES.TXT
Directory Of Disk A:
                                                        SCOM.CRT
                                                                           SCOM.DAT
  COMMAND.COM
                                        SCOM.CMD
                   HAYES.TXT
                                        SCOM.OVR
                                                      SCOMFIX.EXE
                      SCOM. HLP
     SCOM.EXE
```

-----Peoples Msg System ----

STEP 8: Enter the name of the file that contains the message you wish to send.

STEP 9: The on-line screen then appears and the first line of text is sent. When the remote system responds with the prompt, the next line of text is automatically sent. To send the next line without waiting for the **Prompt Character** or **Send Time-out** to elapse, press the space bar.

6 Communicating with Computers

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Chapter Objectives

Focus on the following objectives toward understanding communications with other computers.

- Learn the steps involved in answering a computer call.
- Examine the use of the error-free file transfer protocols.
- Recognize the utility of accessing a computer system from a remote location.
- Understand the benefits of Smartcom II for the originator and answerer of a call.

Introduction

Up to now the discussions and examples have been primarily concerned with "remote computer" communications, where "remote computer" refers to a large computer capable of simultaneously handling numerous incoming calls. Operators at such remote computers do not directly interact with the caller. Connection is made in the same manner each time the system is called, and specific parameter settings and commands are used when connected to these systems.

Now the discussion turns to communication sessions with other microcomputers and computer terminals which require your computer to emulate the VT102/VT100 or VT52 format.

Micro-to-Micro Communication

When two microcomputers are involved in a communications session, the operators communicate directly with each other; they must coordinate activities and select compatible parameter settings. Smartcom II provides the means of answering a call from another microcomputer and of transferring files error-free. To communicate, you must know what operating system the other microcomputer is using, if it is also running Smartcom II, what character formats it will accept, and other characteristics.

Answering a Call

When you select 1-BEGIN COMMUNICATION followed by A for ANSWER, Smartcom II directs the Smartmodem to wait for a call and to answer it automatically after a designated number of ringing signals. Smartcom II then performs special actions identical to those performed by a time-sharing system when it answers a call. When communicating in full-duplex, a remote system echoes characters for display on your screen (see Chapter 2) so that you may see on your screen all data sent and received. The remote system also follows each carriage return with a line feed character to prevent text from being written over the same line.

Unlike many communication programs, Smartcom II performs these two functions when it answers a call from another microcomputer. Hence, you may communicate with any microcomputer system just as a national network does.

To allow Smartcom II to perform these functions, access the Parameters of the Communications Set to be used and set Duplex to FULL and Include Line Feeds to YES. Smartcom II then displays both incoming and outgoing characters and ensures that only one line feed follows each carriage return.

Other parameters that require attention when answering a call include Baud Rate and Answer On Ring.

When Smartcom II answers a call through the Smartmodem 1200, it automatically adjusts your **Baud Rate** to match that of the originator (300 or 1200 bps only). If Smartcom II is set for 1200 bps and you receive a call at 300 bps, Smartcom II automatically changes the **Baud Rate** on the Parameters screen from 1200 to 300, resets the modem, and establishes communication. However, if Smartcom II is set for 300 bps and you receive a call at 110 bps, communication is established but you must manually access the Parameters screen and reset Baud Rate. The same carrier frequencies are used for 110 and 300 bps transmission. The program recognizes two different carrier signals only—the high speed carrier (1200 bps) and the low speed carrier (110 or 300 bps). Thus, Smartcom II adjusts the Baud Rate for 1200 and 300 bps calls only.

The parameter **Answer on Ring** directs Smartcom II to answer a call after a designated number of ringing signals. The standard value for this parameter is one ring. The number of rings may be increased so that you may pick up the telephone receiver before the computer answers the call (when you are expecting a voice call).

All other parameters may be set to the same values as when you originate a call. To answer a call, perform the same basic steps as when you originate a call.

STEP 1: Press 1, BEGIN COMMUNICATION, from the menu screen.

STEP 2: Press A for ANSWER.

STEP 3: Select a Communication Set containing the desired parameter set.

A **Phone Number** defined for the Communication Set is ignored since you are answering a call.

Sending the Log-on Message

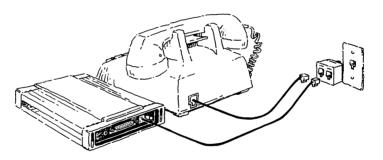
When a remote computer system answers a call, it often sends a greeting to the caller. This greeting may include the name of the computer, the company or university name, etc. You may also store a message to be sent to the caller whenever your computer answers a call. Enter this as a value on the Configuration Screen.

```
CONFIGURATION
PRINTER CONFIGURATION:
                                                                              Press F2 For Help
                      Printer Interface: PARALLEL PORT
                      Printer Baud Rate: 1200
              Remove Extra Line Feeds: NO
                                     Add NULs:
SMARTMODEM CONFIGURATION:
                    Communications Port: COM1:
                           Dialing Method: PULSE
                   Pause Time For Comma: 2 ( 0-255 seconds )
Touch-Tone Timing: 70 ( 50-255 0.001 seconds )
         Wait For Carrier Signal: 30 (1-255 seconds)
Recognize Carrier Signal: 6 (1-255 seconds)
Recognize Carrier Signal: 7 (1-255 seconds)
Recognize Carrier Signal: 7 (1-254 0.1 seconds)
Speaker Status: 0N UNTIL CARRIER
SPECIAL VALUES:
                  Default Set: Z
Available Disk Drives: AB
                     Monitor and Adapter: MONOCHROME DISPLAY ADAPTER WITH MONITOR Log-on Message: Smartcom II
                                 Record To Disk? (Y/N): Y
```

The Log-on Message is limited to 40 characters. Only printable ASCII characters may be entered. If you want to include a control character in your message, enter a caret (^) followed by the character.

Switching Between Voice and Data Communication With Smartcom II you may readily switch between voice and data communication without disconnecting and redialing. Online prompts let you know when to pick up or hang up your telephone. To use this procedure with a freestanding Smartmodem, connect both the telephone and modem to the same telephone line. The easiest way to accomplish this is to purchase a two-way telephone connector or "Phone Y" and plug it into the wall telephone jack. If you have a boardlevel Smartmodem, keep the telephone plugged into the back of the modem in the normal manner.

Two Way Telephone Connector (Telephone Y)



This double connection is helpful during a file transfer session. Use your telephone to dial the other party and discuss the transfer. After the details have been worked out (i.e., names of files, necessary disk space, baud rate, duplex and protocol), you can change to data communication mode without redialing.

From the main menu option 1, Begin Communication, enter \mathbf{D} for DATA to initiate the switch from voice mode to data communication. To switch from data communication mode to voice mode, select main menu option \mathbf{O} , END COMMUNICATION/PROGRAM, then enter \mathbf{V} for VOICE. The exact sequence of events and prompts is described below.

Voice communication can be established by one of two means: One party calls the other; or, if communication was initiated via modems, both parties command their modems "off-line" and pick up their telephone receivers when prompted.

Do not talk over the telephone while the computers are transmitting data. Voices disrupt the transmission process.

Procedure for changing from voice to data communication:

Us	ser One	User Two
1.	Select main menu option 1, BEGIN COMMUNICATION. Enter D for DATA. (User One becomes the answerer).	Wait until you hear the modem tone, then select menu option 1, BEGIN COMMUNICATION. Enter D for DATA. (User Two becomes the originator.
2.	Hang up telephone.	Hang up telephone.
3.	Commence transfer of data files using normal file transfer procedures.	Commence transfer of data files using the normal file transfer procedures.
4.	To go back to voice communication, use the procedure in the next table.	To go back to voice communication, use the procedure in the next table.
	OR	OR
	From the main menu enter 0 , END COMMUNICATION/ PROGRAM, followed by H , HANG-UP.	From the main menu enter 0 , END COMMUNICATION/ PROGRAM, followed by H , HANG-UP.

Procedure for changing from **data to voice** communication:

User One	User Two
Present situation: User One wants to change to voice communications.	Present situation: User Two is on-line.
 Select menu option 0. END COMMUNICATION/ PROGRAM. 	No action.
3. Enter V. VOICE to request switch-over to voice communication. Screen will display: Voice request in progress Press to cancel.	Screen displays: Request to go to voice conversation Press to start. Press defined Escape Key after message appears.
4. After a few moments, the screen will display: Voice request completePick up phone now. Pick up telephone within three seconds.	After a few moments, the screen will display: Voice request completePick up phone now. Pick up telephone within three seconds.

If you do not pick up the telephone within three seconds, the computer will hang up the telephone—as would happen in a home situation if someone hangs up your kitchen extension before you pick up the bedroom telephone.

5. Commence with conversation. Commence with conversation.

At this point either user can initiate the change to data communication by using the procedure described in the previous table; i.e., both select menu option 1, then enter ${\bf D}$ for DATA mode.

Transferring Files Between Microcomputers

After establishing a connection with a remote computer, answer the following questions before attempting to transfer files.

Questions

Notes

- What kind of communication software is the other computer system using? Is it a version of Smartcom II, of the Hayes Terminal Program for the Apple II, or a version of Smartcom I for the Apple II, or a program from another software manufacturer?
- Identifying the software used by the remote microcomputer helps to determine the appropriate transfer protocol. If using software with a compatible protocol (Hayes Verification or X-MODEM) you may transfer a file error-free.
- Stop/Start or Send Lines may be used with any software.
 These are approximately 25% faster transfer protocols, but do not guarantee a perfect transfer.
- 2. What character format is the other system using? Are all eight data bits of each character meaningful?
- If it is imperative that all data bits be transferred without errors, an Error-Free protocol should be used, when possible.
- If you are unable to use an Error-Free protocol, change to Stop/Start Protocol, set Character Processing to DIRECT, and select a Data Format that provides for eight data bits.

Notes

- 3. How do you start the file transfer? Has a procedure been worked out to ensure that the receiver is ready to accept data before the sender begins to transmit?
- If the Hayes verification protocol is used, it is not critical to know which computer will initiate the transfer. The sender continues to transmit a block of data until the receiver is ready to accept it. Hayes Verification allows time for both systems to synchronize to begin the transfer.
- If the X-MODEM protocol is used, the sender needs to initiate the file transfer. The sender waits for a response from the receiver before beginning the transfer. The receive process must be started within 90 seconds of the time the send process is initiated.
- The file transfer is simplified if Remote Access is used (explained later in this chapter).
 The originator then controls the complete file transfer.
- If the Stop/Start or Send Lines Protocol is used, the receiver MUST be ready to accept data before the sender begins to transmit; otherwise, characters will be lost.

Using Error-Free Protocols

If the remote microcomputer is using communications software which includes a compatible Error-Free protocol, use the protocol to transfer, with complete error checking, any type of file.

- Use the Hayes Verification Protocol for error-free communication between Hayes programs or Hayes-compatible programs such as M.I.T.E. (Mycroft Labs, Inc.).
- Use the X-MODEM Protocol for error-free communication between Hayes programs and X-MODEM-compatible programs such as PC-TALK or CROSSTALK.

Several characteristics of the Error-Free Protocol not offered by the Stop/Start or Send Lines Protocols are described below.

- An Error-Free Protocol may be used only between microcomputers using compatible communications software. (For example, software which supports the Hayes Verification Protocol or the X-MODEM protocol.) The microcomputers may be different but the protocol must be the same.
- Both text and object code files may be transferred using an Error-Free protocol. All eight data bits of each character are transferred unchanged and the setting of Character Processing is ignored.
- 3. Error-free transfer is possible. The detection of errors automatically causes the data block to be re-sent.
- 4. The Error-Free Protocols incorporate their own time-out values for controlling transfer. **Receive Time-out** and **Send Time-out** on the Parameters screen are ignored.

To use the Error-Free Protocol to transfer files while online with another microcomputer, follow the steps below.

Receiver

1. Press the Escape Key to return

	return to the menu screen.	to the menu screen.
	2. Select 5 . Send File from the menu screen.	Select 4. Receive File from the menu screen.
	3. Press 1 to select Error-Free* Protocol.	3. Press 1 to select Error-Free* Protocol.
	 When prompted to Enter File Name. type the name of the file to be sent. 	 When prompted to Enter File Name, type the name of the file to be received.
*The Error-Free Protocol chosen in the currently active PARAMETER screen will be activated.		

Sender

1. Press the Escape Key to

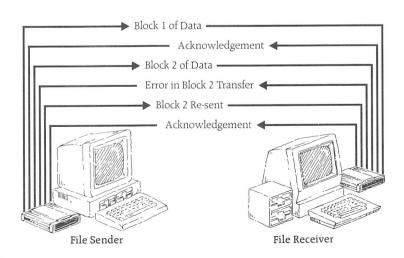
```
Hayes Microcomputer Products, Inc.
   Smartcom II
*. Begin Communication 4. Receive File 7. Change Printer Status (OFF) 2. Edit Set 5. Send File 8. Select Remote Access (OFF) 3. Select File Command *. Change Configuration 9. Display Disk Directory (ON)
A,B - Change Drive
                                                      O. End Communication/Program
                           Press F2 For Help
Enter Selection: 4
                           1) Error-Free, 2) Stop/Start
Select Protocol: 1
Enter File Name: HAYES.TXT
Directory Of Disk A:
  COMMAND.COM
                      HAYES.TXT
                                          SCOM.CMD
                                                            SCOM.CRT
                                                                              SCOM.DAT
     SCOM.EXE
                       SCOM. HLP
                                          SCOM.OVR
                                                         SCOMFIX.EXE
                                                                            STOCKS.TXT
                                       PARA
  Name of Set: P - ABC BULLETIN BOARD
                                                          Press F2 For Help
          TRANSMISSION PARAMETERS
                                                            KEYBOARD DEFINITIONS
                Duplex: FULL
                                                         Escape Key: 128 (F1
                  Baud:
                                                           Help Key: 129 (F2)
Character Processing:
                                                        Printer Key: 130 (F3)
                         FORMATTED
  Show Control Codes:
                          NO
                                                        Capture Key: 131 (F4)
           Page Pause:
                                                   Macro Prefix Key: 132 (F5)
                          NO
   Show Status Lines:
                         YES
                                                         Break Key: 133 (F6)
                                                       Break Length: 35 (0.01 sec.)
Protect Key: 134 (F7)
         Confidential:
                          NO
  Include Line Feeds:
                          NO
                          0 (0.001 sec.)
0 (0.01 sec.)
     Character Delay:
           Line Delay:
                                                             PROTOCOL PARAMETERS
    Character Format:
                         7 DATA + EVEN + 1 STOP
                                                         Receive Time-out: 60 (sec.)
                                                            Send Time-out: 10 (sec.)
             Emulator:
                         TTY
                                                      Error-Free Protocol: XMODEM
      TELEPHONE PARAMETERS
                                                     top/Start- Stop Char: 19 (DC3)
                                                     Start Char: 17 (DC1)
Send Lines- EOL Char: 10 (LF)
Prompt Char: 63 ("?")
Answer On Ring: 1
Remote Access: NO
                          Password:
  Phone Number: T9, P555-2368
                               Hayes Mi
                                         rocomputer Products, Inc.
   Smartcom II
*. Begin Communication 4. Receive
                                        File
                                                       7. Change Printer Status (OFF)
                                                      8. Select Remote Access (OFF)
                           5. Send F
2. Edit Set
3. Select File Command *. Chang
                                      Configuration 9. Display Disk Directory (ON)
A,B - Change Drive
                                                       O. End Communication/Program
                           Press |
                                     For Help
Enter Selection: 5
Select Protocol: 1
                           1) Error-Free, 2) Stop/Start, 3) Send Lines
Enter File Name: A: HAYES.TXT
Directory Of Disk A:
  COMMAND, COM
                       HAYES.TXT
                                          SCOM.CMD
                                                             SCOM. CRT
                                                                               SCOM.DAT
                        SCOM. HLP
                                          SCOM. OVR
                                                         SCOMFIX.EXE
                                                                             STOCKS.TXT
      SCOM. EXE
```

While receiving a file via the Error-Free protocol, the Status Lines keep you informed of the transfer. The file name appears on the Upper Status Line; the lower Status Line displays messages that relate the sequence of events that occur during the transfer.

When receiving or sending a file, status messages appear on the screen for both the sender and receiver. Status messages used with Error-Free protocols are explained below. For example purposes, the word "Receive" has been used. It is replaced with the word "Send" when these messages appear on the sender's screen.

Status Message	Meaning
Receiving Block XYZ (W Tries)	The file is transferred as blocks. typically 512 bytes for the Hayes protocol and 128 bytes for the X-MODEM protocol. If a block is not received correctly, it is again transmitted. In this message. "W" represents the number of tries; it is incremented by 1 each time the block is transmitted, up to 7 times for Hayes protocol. 10 times for X-MODEM protocol. "XYZ" represents the number of the block.
Receive Canceled Block Retry Count Exceeded	If a block is sent more than the maximum number of times allowed, the transmission is canceled. This occurs when both systems are not using the same Error-Free Protocol or if the communication line is extremely "noisy."

Status Message	Meaning
Receive Canceled Block Time-out Exceeded	If the sender does not send any information within a predetermined period of time, a message is sent by the receiver to the originating computer. If this occurs the maximum number of times without response from the sender, the transmission is canceled.
Receive Canceled Other System Canceled	Sender pressed the Escape Key before the transfer is complete.
	OR
	Receiver encountered problems with the disk, for example no available space.
Receive Canceled Carrier Lost	The two systems have been disconnected during the file transfer process.
Receive Cancelled	Receiver pressed the Escape Key during the transfer.
Receive Complete XXXX Bytes	When the transfer is successfully completed, the total number of data bytes transferred is displayed (represented by XXXX).



Using Stop/Start Protocol

The discussion of the Stop/Start Protocol in Chapter 5 concerned use of the protocol when communicating with a remote network system at which a computer operator is not present. When transferring files with another microcomputer, however, both operators may have to be involved in the transmission.

Both operators should be present to check parameters and discuss appropriate settings. The Stop Character and Start Character for the systems must match. The operators must verify with each other which characters will perform the stop and start actions. The **Data Format** and **Character Processing** parameters are also important. It is usually safe to select FORMATTED Character Processing and the Data Format 8 data bits, no parity, and 1 stop bit.

The Stop/Start Protocol may be used regardless of the communications software used by the other microcomputer. Stop/Start is a much faster method of transfer than Error-Free; however, it does not perform any error checking and only normal text files should be transferred

Before transmitting, the sender must be sure that the receiver is ready to receive data; otherwise, characters will be lost. The sender should be aware of the receiver's Receive Time-out parameter. This value determines the amount of time that the receiver waits for the first incoming character. Normally, this value is 60 seconds; thus, the sender has one minute to begin the transfer. If the Receive Time-out expires before a character is received, the file transfer is canceled.

The receiver must be aware of the sender's Send Time-Out setting. If the receiver sends a Stop Character to halt the transfer while data is recorded on disk, a Start Character must then be sent to resume the sending process. However, if the Send Timeout value expires before the Start Character is issued, the sending process automatically begins again. The receiver must see that the sender sets this parameter high enough so that data is not sent before the receiver is ready.

To use the Stop/Start Protocol to transfer files between microcomputers, follow the steps provided previously for Error-Free Protocol: this time, press 2 at Step 3 (both sender and receiver).

Using Send Lines Protocol

The Send Lines Protocol may be used to transfer text files between microcomputers if the receiver issues a **Prompt Character** to request data or if the receiver only accepts data a line at a time.

Remote Access

With Smartcom II, the originator of a call may control the file transfer process without any participation from the answerer by activating Remote Access. Remote Access eliminates the coordination of actions generally required for a file transfer. Remote Access also allows the answerer to leave the computer unattended for access by other Smartcom II users, for sending and receiving files.

In Remote Access mode, all file transfer is performed with a remote access protocol; hence, any type of file may be transferred.

A **Password** is provided as a parameter so that you may limit access to your system when unattended in Remote Access. You may define a password for each Communication Set. The Set you select to answer a call in Remote Access determines the required password. Since only one Communication Set is in effect at a time, only one password is accepted. Defining a different password for each Communication Set enables you to control when and by whom your files may be accessed. Remember that the **Password** is a built-in security measure; distribute passwords with care.

If you plan to call a system left in Remote Access, be sure to obtain the valid password for the remote Communication Set; otherwise, the connection will not be completed.

Remote Access Protocols

Protocol Types: When using menu option **8**, SELECT REMOTE ACCESS, Smartcom II offers two choices: None (No remote access) or Hayes Verification protocol.

- Use the Hayes Verification protocol for remote access file transfer between Hayes programs or Hayes-compatible programs.
- Use the **None** choice to disable remote access procedures.

Selection of Remote Access Protocols: Remote access protocols are selected under the **Telephone Parameters** heading in the PARAMETERS screen of the Communication Set. Therefore, select a convenient Communication Set and choose the required protocol prior to starting the communications process.

Considerations of Leaving Your System in Remote Access

Before leaving your system in Remote Access, consider the following questions and reminders.

- How many users know the Password for the Communication Set selected to answer a call in Remote Access? Do all those who should be allowed access to the sysem know the current password? Is there anyone who should not have access to your files?
- 2. Do all **Available Disk Drives** contain disks? Do you wish to make available all of the files located on these disks? Do you have backup copies of the files on these disks in case they are inadvertently erased? Do the operators who will access your system understand your file name conventions?
- Is there sufficient space on your disk for storing an incoming file? If there is insufficient space, only part of the file will be recorded.
- 4. Does the other system support a compatible remote access protocol?

There are two ways you may activate the Remote Access feature of Smartcom II. One way is to set the parameter **Remote Access** to YES for the current Communication Set and select ANSWER call. Other systems using Smartcom II or a compatible software package may then call your computer and perform file transfers. You need not be present while these transfers take place.

The second way to enter Remote Access is to select the menu option 8. SELECT REMOTE ACCESS while on-line with another computer also using Smartcom II or a compatible software package. Both operators must be present and both must select menu option 8. The originator gains control over the answering computer.

Further discussion of these two methods follows below.

Unattended Operation with Remote Access

For unattended operation, the computer you intend to call must be left in the Answer mode. The parameter Remote Access must be set to Hayes for the current Communication Set. Below are the steps which the answerer must perform to enable remote access, followed by the steps which the call originator performs to gain remote access.

Answerer-Leaves Computer Unattended

- 1. Select a Communication Set and make the following changes on the Parameters screen.
 - a. Set Remote Access to Hayes.
 - b. Enter a Password to match that of the originator.
 - c. Chest other parameters for compatibility.
- 2. Select menu option 1, BEGIN COMMUNICATION: select A, for ANSWER. Select the Communication Set described above.
- 3. When Remote Access is established, the menu remains displayed and the following message appears: "REMOTE ACCESS Auto-Answer." The program then accepts calls. verifies the password, and permits file transfer and file maintenance commands.
- 4. Remains in Remote Access until you press the Escape Key. When the carrier is lost, the computer waits for another call.

Originator—Controls Entire Process

- 1. Select a Communication Set and set the following Parameters
 - a. Set Remote Access to Hayes.
 - b. Enter a Password to match that of the answerer.
 - c. Check other parameters for compatibility.
- 2. Select menu option 1, BEGIN COMMUNICATION; select 0. to ORIGINATE the call. Select the Communication Set described above.
- 3. Once connection is made with the answerer, proceed with your desired actions (e.g., file transfer, rename files, etc.).
- 4. Use menu option 0, END COMMUNICATION to disconnect from the remote computer.

What Happens when Connection is Made?

Once connection is established between the two computers, information is exchanged that includes the password, log-on message, and system type.

This exchange of information occurs as follows:

- The answerer begins the exchange of information by sending the Log-on Message followed by the message REMOTE ACCESS. If the originator is not currently in Remote Access, this message informs the originator that the answerer has been left in Remote Access. If, however, the call was originated in Remote Access (i.e., parameter set to Hayes), the message does not appear but the exchange of information continues.
- 2. The originator then sends the Password for the current Communication Set. The Password is sent to the answerer up to three times, using the remote access protocol, until it is either accepted or rejected.
- 3. The answerer compares the received Password with the one entered on the answerer's Parameters screen. If they match, an acknowledgement is sent to the originator. If they do not match after three attempts, the following error message appears on the lower Status Line: Log In Not Accepted: Invalid Password. The answerer releases the telephone line and waits for the next call. The originator must also select END COMMUNICATION and check the Password to make sure that it is correct.
- 4. Assuming that the password is accepted, Smartcom II then prepares a block of data consisting of the originator's **Log-on Message** and sends it to the answerer. This message is displayed on the answerer's screen.
- 5. The answerer then sends information to the originator consisting of the **Log-on Message**, system type, current disk drive, and **Available Disk Drives**.

6. Finally, the originator requests acknowledgement from the answerer that the log-on is complete. If it is, a message appears on the lower Status Line:

LOG-IN ACCEPTED: (Originator's Log-on Message)

If the program is not able to verify information with the answerer, an error message is displayd on the lower Status Line:

LOG-IN NOT ACCEPTED: System Not Recognized

This may occur if you mistakenly use Remote Access to call a system not set for Remote Access. In this case, set **Remote** Access to NONE and again call the remote computer.

The complete exchange of information takes place in a matter of seconds. The lower Status Line keeps you informed of the progress of the log-on procedure. These messages have the same format and meaning as the Error-Free protocol messages described earlier in this chapter.

Originator's Menu Screen

```
Smartcom II
                                  Hayes Microcomputer Products, Inc.
*. Begin Communication 4. Receive File 7. Change Printer Status (OFF 2. Edit Set 5. Send File 8. Select Remote Access (ON) 3. Select File Command *. Change Configuration 9. Display Disk Directory (ON)
                                                                 7. Change Printer Status (OFF)
A,B - Change Drive
                                                               0. End Communication/Program
                                Press F2 For Help
Enter Selection: 2
             Maintains communication sets including parameters and macros
Directory Of Remote Disk B:
                                          COMMAND.COM CONFIG.SYS DEBUG.COM
DRAFT.TXT FORMAT.COM IBMCOMPA.TXT
PRA.BAK SD.COM TIYSET.BAT
VOEL.COM WS.COM WSMSGS.OVR
                          COLOR, COM
    CHKDSK.COM
 DISKCOMP.COM DISKCOPY.COM
   LOTUS1 NECSET.BAT
V18LTR V18LTR.BAK
     WSNEC.COM WSOVLY1.OVR
```

-----Remote Access-----

Answer's Menu Screen

<< REMOTE ACCESS >>>
Connected To:

Smartcom II - IBM Personal Computer

--- Remote Access-----

Using Remote Access When Both Operators Are Present When both computer operators are present and a connection is made without Remote Access, it may be convenient for one user to control an entire file transfer process. With Smartcom II, both the originator and answerer may enter Remote Access by selecting menu option 8. Remote Access alleviates the problem of the sender beginning transmission before the receiver is ready. The Password verification is skipped and the originator immediately gains control of the other computer.

The same actions may be performed as previously discussed. When the file transfer and other actions are complete, both operators must set menu option 8, SELECT REMOTE ACCESS, to OFF.

Capabilities of Remote Access

The following selections may be performed by the originator on the remote system.

When menu option **8**. SELECT REMOTE ACCESS is set to **ON**, all menu selections affect the remote system only. For example, both the Disk Directory and list of available disk drives, which appear on your screen, are for the remote system.

1.	CHANGE DRIVE	At the prompt Enter Selection , enter the letter of the drive you wish to access on the remote system.
2.	DISPLAY DISK DIRECTORY	With menu option 9 set to ON, the Disk Directory of the current disk of the remote system is displayed.
3.	RECEIVE FILE	Originator uses menu option 4 to receive data from the remote system.
4.	SEND FILE	Originator uses menu option 5 to transfer data to the remote system.
5.	RENAME File	Originator may rename a file stored on a remote system disk. First select menu option 3. SELECT FILE COMMAND.
6.	ERASE File	Originator may erase files on the remote system disk. First select menu option 3. SELECT FILE COMMAND.

To perform the menu commands for your own system, select 8 to set Remote Access to OFF. You may then perform the menu selections as you normally would, while maintaining on-line communication with the remote system. To resume Remote Access, again select 8.

If the computers are running under the same or similar operating systems, all six menu selections mentioned above are available for use.

If, however, the computers are running under two operating systems which Smartcom II does not consider similar, four restrictions are placed on these options: 1) You may not access a different disk drive on the remote system by using CHANGE DRIVE; 2) The disk directory of the remote system cannot be displayed; 3) File names entered may not include wild cards; and 4) Validation of remote system file names is not performed. However, you are permitted to enter any 16 characters as a file name to be validated by the remote system.

Two computers running under the same operating system are considered similar. Smartcom II also makes adjustments for the slight differences between the MS-DOS and CP/M operating systems so that they may be considered similar. When these two operating systems are communicating, you may use all six options.

The menu options available in Remote Access are discussed in detail below

Change Drive

The **Available Disk Drives** of the remote system are transferred to your system during the log-on procedure. The labels of the drives now appear on your screen next to the option CHANGE DRIVE.

Caution: The answerer must enter as Available Disk Drives only those that may be accessed and that contain disks. The originator can permanently halt the remote system by selecting a drive that is unavailable or does not contain a disk.

Display Disk Directory

The originator may display the Disk Directory of the remote computer to determine what files are stored on the remote system disks. The Disk Directory for the disk in the current drive is shown when menu selection 9, DISPLAY DISK DIRECTORY, is ON.

Note: You may not be able to view the remote system's directory if there is insufficient disk space on the Smartcom II disk (local or remote), or the Smartcom II disk is "write protected."

When you wish to view your own Disk Directory, set menu option 8. SELECT REMOTE ACCESS, to OFF. The Directory for the local disk is then displayed. Remember to set menu option 8. SELECT REMOTE ACCESS, to ON before proceeding.

When you delete or rename files on the remote system, your copy of the remote system's Disk Directory is not automatically updated because this is a time-consuming process. Press the letter that corresponds to the current disk drive to request that a new copy of the Directory be sent from the remote system.

Receive File

Menu option 4. RECEIVE FILE, does not require you to select a protocol. All file transfers are performed with the remote access protocol selected in the active Communication Set. After you enter the file name under which the received data is to be stored on your disk, the following prompt appears next to the file name:

Same Remote File Name? (Y/N):

If you answer **Y** for "yes," the receiving process begins immediately. If you answer **N** for "no," you are prompted for the name of the file you are requesting from the remote system.

If you wish to receive more than one file, you may use wild cards in the file name. When the prompt **Enter File Name** appears, enter the wild card name for the files you wish to receive. You are not prompted for another file name; the files received retain the names that they have on the remote system.

Send File

To send a file, select menu option 5, SEND FILE. You are not asked to select a protocol since Remote Access automatically uses the Hayes Verification protocol selected in the active Communication Set. After entering the name of the file to be sent, the following prompt appears next to the file name:

Same Remote File Name? (Y/N):

If you answer **Y** for 'yes,' the sending process immediately begins. Answering N for "no" produces the prompt Enter File

If you wish to send more than one file at a time, you may use wild cards in the file name. When the prompt Enter File Name appears, enter the wild card name. All files that match the name are recorded on the remote system disk just as they appear on your disk. You are not prompted for another file name; the files retain the names they have on your system.

Rename File

It is possible to rename files on the remote system by selecting menu option 3. SELECT FILE COMMAND followed by R for Rename.

The file names entered are validated according to the guidelines of the remote computer's operating system.

Erase File

It is possible to erase any file shown in the remote system Disk Directory except a Read-Only file or a file with a reserved file name. Remember, Smartcom II files cannot be erased with the program. When these file names are entered, the error message *Reserved File Name* is generated.

Special Functions

Turning on Compressed Printing To produce compressed (condensed) printing on your printer while using Smartcom II, you can create a file that contains the control character (s) your printer uses to turn on compressed print, then route the file to your printer. Your printer will then produce compressed print until you turn the printer off. In the steps below, you create this file and save it on your Smartcom II disk for future use.

To create the file:

- 1. From the Main Menu, choose option 2. Edit Set.
- 2. From the command line, choose option S(elect Set.
- 3. When prompted to **Enter Label**, choose any communication set. (Remember which set you choose; you will re-enter it later).
- 4. From the command line, choose option P(arameters.
- 5. When the Parameters Screen is displayed, press Return three times, the cursor will be at Character Processing.
- If Character Processing is set to FORMATTED, press the right arrow key once to change FORMATTED to DIRECT.
- 7. Press Escape Key. The Main Menu then reappears.
- 8. From the Main Menu, choose option 3, Select File Command.
- 9. From the command line, choose option C(reate.
- 10. When prompted to **Ener File Name**, type the name you have chosen for the file, and press **RETURN**. The screen will clear.

The action you take in the next step depends on your printer make and type. Nothing will appear on the screen as you execute the next two steps.

- 11. If you have an *Epson MX* printer, press the Ctrl key and, while holding it down, press O (capital O).
 - If you have an Epson FX printer, press the Esc key, release it, and then press the Ctrl key and, while holding it down, press O (capital O).
 - If you have an *Okidata* Microline printer, press the Ctrl key and, while holding it down, press the] key.
 - If you have a *NEC 8023* or *8025* printer, press the **Esc** key, release it, then press the **Ctrl** key, and while holding it down, press **O** (capital O).

If you have a printer other than the ones used above, consult the printer manual or your dealer for the proper control characters to use.

- 12. Press Return.
- 13. Press Escape Key; your file is now saved on the disk.
- 14. Repeat Steps 1-8, this time changing **Character Processing** from **DIRECT** to **FORMATTED**.

The file which turns on compressed printing is now created.

To turn on compressed printing:

- 15. From the Main Menu, choose option 2. Edit Set.
- 16. From the command line, choose option S(elect Set.
- 17. When prompted to **ENTER LABEL**, choose any communication set. (Remember which set you choose; you will reenter it later.)
- 18. From the command line, choose option P(arameters.
- 19. Smartcom II will display the Parameters Screen; Press Return three times. The cursor will be at Character Processing.

- 20. If **Character Processing** is set to **FORMATTED**, press the right arrow key once to change **FORMATTED** to **DIRECT**.
- 21. Press Escape Key to return to the Main Menu.
- 22. From the Main Menu, choose option 3. Select File Command.
- 23. From the command line, choose option P(rint.
- 24. When prompted to **Enter File Name**, type the name of the file that contains the special printer characters, and press **Return**.
- 25. Press any key. On some printers, the file will begin printing; on others, you see and hear nothing.
- 26. Press **Escape Key** to return to the Master Menu. Repeat steps 15-21, this time changing **Character Processing** from DIRECT to FORMATTED at step 20. The printer is now set for compressed print, and will continue to print this way until you turn the printer off. To return to compressed printing later, repeat steps 15-21.

Emulation

Introduction

Terminal emulation is a process which enables your computer to respond like another terminal for the purpose of information interchange. Smartcom II offers four different types of emulation for each of the communication sets. This means that you can choose one of the following four emulators in each Communication Set.

- TTY
- Televideo Subset
- VT52
- VT102/VT100

Selecting Emulator Type

In each Communications Set you can select one of four emulators:

TTY, Televideo Subset, VT52, VT102/VT100

The default value (if you don't specify an emulator) is TTY, the method most frequently used by information services and electronic bulletin boards.

Follow these steps to assign or change an emulator:

- STEP 1: From the Smartcom II menu, select option 2, EDIT SET. Press **S** for SET.
- STEP 2: Enter the label (A-Z) of the desired Communication Set.
- STEP 3: Press P to produce the Parameters screen.
- STEP 4: Move the cursor to **Emulator** by pressing return.
- STEP 5: Press the right or left arrow key until the desired emulator choice appears on the screen.
- STEP 6: Press return to move the cursor to the bottom of the screen. Stop when Record to Disk? (Y/N): appears on the screen.
- STEP 7: Enter **Y** for yes. The emulator type selected is now recorded with all other parameters on your disk.

TTY Emulator (Default Mode)

In TTY emulator mode, the console driver understands the standard ASCII character set and the following control codes:

Code Mnemonic	Function
BEL	Generate bell tone
BS	Move cursor one character to left
CR	Return carriage
DEL	Delete (Character is ignored)
HT	Horizontal tab
LF	Line Feed
NUL	Null (character is ignored)

Televideo Subset Emulator

In Televideo emulator mode, data is handled without any special character processing. It allows you to make full use of control codes when creating or viewing files and transmitting information. The console driver understands all TTY emulator functions and the SUB and ESC = YX CODES, as summarized below

Code Mnemonic	Function
BEL	Generate bell tone
BS	Move cursor one character to left
CR	Return
DEL	Delete (Character is ignored)
HT	Horizontal tab
LF	Line Feed
NUL	Null (character is ignored)
SUB	Clear screen
ESC = YX	Move cursor to X Y character ordinals

VT102/VT100 and VT52 Emulator

Features and Limitations

and VT52 Emulator Smartcom II emulates VT52, VT102, and VT100 type terminals with respect to screen addressing and keyboard inputs. Only those functions and codes specifically mentioned in this section are implemented.

When you select VT102/VT100 or VT52 emulation, your computer keyboard will behave somewhat differently. Specific keyboard equivalencies for your computer are detailed under "Key Equivalencies for VT102/VT100 and VT52 Emulators" in Chapter 1.

In VT52 emulator mode, the computer recognizes the codes listed in the following table:

VT52 Code	Function
BEL	Generate bell tone
BS	Move cursor one character to left
CR	Return carriage
DEL	Delete (character is ignored)
HT	Horizontal tab
LF	Line Feed
NUL	Null (character is ignored)
VT, FF	Do line feed operation
CAN, SUB	Cancel escape sequence
ESC =	Set application on numeric keypad
ESC >	Set numeric on numeric keypad
ESC Z	Identify terminal
ESC <	Enter VT102/VT100
ESC A	Cursor up
ESC B	Cursor down
ESC C	Cursor right
ESC D	Cursor left
ESC F	Enter graphics mode
ESC G	Exit graphics mode
ESC H	Cursor home
ESC I	Reverse line feed
ESC J	Erase to end of screen
ESC K	Erase to end of line
ESC Y l c	Move cursor to line, column

VT102/VT100	Function
ESC D	Index, perform line feed operation
ESC M	Reverse index
ESC E	New line
ESC 7	Save cursor position
ESC 8	Restore cursor position
ESC =	Set application on numeric keypad
ESC >	Set numeric on numeric keypad
ESC (A	Set US as G0
ESC (B	Set US as G0
ESC (0	Set Special and Line Drawing as G0
ESC) A	Set US as G1
ESC) B	Set US as G1
ESC)0	Set special and Line Drawing as G1
ESC N	Next character is Default set
ESC O	Next character is Default set
ESC [Pa m	Set character attribute
ESC H	Set tab
ESC [Pt g	Clear tab (s)
ESC [Pe K	Erase in line
ESC [Pe J	Erase in page
ESC [Pn P	Delete characters
ESC [Pn L	Insert lines
ESC [Pn M	Delete lines
ESC [Pr n	Request device status report
ESC [Pi c	Request device attributes
ESC c	Reset terminal

VT102/VT100 emulation also provides the following display features:

Display Feature	Description
Bold	Causes character to be shown with extra intensity.
Underlined	Causes character to be shown with line drawn underneath.
Blinking	Causes character to flash on and off, a few times per second.

Display Feature Description

Reverse video Causes character to be shown in reverse of the default character/background colors.

Graphics Two selected character sets are supported simultaneously, along with the single shift-

ing of single characters into one of two alternate character sets. Only ASCII and Special Characters and Line Drawing sets are supported. These character sets may be subsets or have substituted characters on

some computers.

Note that some of the display features may not work concurrently with other characteristics. For example, the bold and underline functions may not be visible together.

Access to Smartcom II

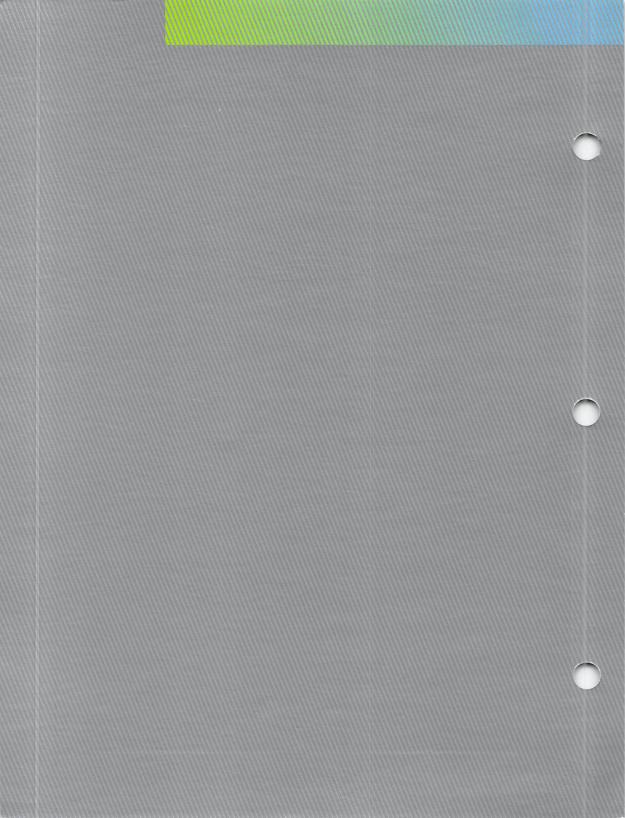
The VT102/VT100/VT52 keyboard definitions are active only while in the emulator mode and on-line to a host system. To use these keys in the normal Smartcom II mode, it is necessary to press the defined "switch" key (see Chapter 1) before the desired Smartcom II function key. The keyboard remains in Smartcom II mode until the user goes back on-line; then, the emulator mode is enabled again.

Recall Buffer Restrictions

When viewing the recall buffer while using any emulator other than TTY, the contents of the buffer may not necessarily reflect the actual activity which took place. This is especially true if the host computer sent any cursor movement codes other than carriage-return or line-feed.

7 Troubleshooting

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Introduction

Smartcom II is designed to work with your complete computer system. Incoming data may be displayed, printed, and stored on disk all at the same time. While this occurs, the incoming characters are examined by the program; some are filtered out and neither displayed on the screen nor sent to the printer. This accommodates the different systems with which you may communicate. Smartcom II is designed to control communication with a variety of remote systems.

This chapter lists symptoms of typical communication problems. When many of these problems occur, Smartcom II displays an error message. These messages are discussed in this chapter. The description of each symptom is followed by the cause or source of the problem and a possible solution.

The symptoms are arranged according to the hardware device or activity likely to cause the problem. You may need to look for a symptom in more than one category, since it is sometimes difficult to determine what part of the configuration is causing the problem.

Smartmodem. Several of the entries relate to the error message "Smartmodem Not Recognized." Other entries describe problems that may occur with the telephone lines. Others concern characteristics of the remote system.

Smartcom II. MS-DOS-related function such as Ctrl-Alt-Del and Prt Scr are not available while using Smartcom II.

Screen Display. Problems with the screen display may also impact the printer and disk files. Many symptoms occur when connected with another microcomputer. Screen display problems may also involve the selection of Monitor and Adapter parameters in your configuration screen.

Printer Output. Many of the symptoms described here concern the protocol used between the printer and the computer. This information is helpful when configuring your system for Smartcom II.

Data Files. When creating and displaying files, problems may occur because of parameter settings or because of the limitations of your computer. This section concerns problems related to stored data, not incoming data.

File Transfer. This section lists problems that may occur during a file transfer. Parameters are included in Smartcom II to help you eliminate these problems.

Keyboard. This section lists problems associated with the Keyboard Definitions included on the Parameters screen. Characters defined as special keys are not transmitted by the modem.

Macros. This section of problems, related to Macros, is a summary of the checklist and guidelines presented in Chapter 4.

Batch Sets. This section lists problems that may occur during recording and playback of Batch Sets.

Error Messages. This section provides a listing of Smartcom II error messages and their meaning.

Smartmodem

Symptom/Indication	Possible Cause or Source	Recommended Solution
LEDs do not blink on the Smartmodem and error message appears: "Smart-	Modem not connected to computer OR modem power not ON.	Make sure power switch is ON and cable is connected from modem to computer.
modem Not Responding. Check Modem. Press Escape Key To Continue.''†	Configured for wrong communications port.	Change Communications Port on Configuration screen.
2. The LEDs blink on the Smartmodem except for the TR LED. Error message appears: "Smartmodem Not Responding. Check Modem. Press Escape Key To Continue."†	Configuration switch 1 on the Smartmodem set in the UP position. Cable being used does support pin 20.†	Change configuration switch 1 to DOWN position.
3. The LEDs blink on the Smartmodem, but error message appears: "Smartmodem Not Responding. Check Modem. Press	Cable wrong; pins 2 and 3 are crossed.	Verify the cable configura- tion needed for your sys- tem. Most systems have a communications port so a straight cable can be used.
Escape Key To Continue.'†	Switch 8 is UP on Smart- modem 1200.†	Switch 8 must be DOWN to process commands.
4. The Smartmodem releases the line when the remote system answers the call.	Length of time Smartmo- dem waits for carrier not sufficient.	Increase value of Wait For Carrier Signal .
5. The "NO CARRIER" status message is displayed after remote modem answers the call.	Called a 300 baud modem with the parameter set to 1200 . OR	Change Baud Rate to 300 and originate call again.
	Timing to recognize a carrier signal is too long.	Decrease value of Recognize Carrier Signal .

†Freestanding Smartmodems only.

Symptom/Indication		Possible Cause or Source	Recommended Solution
6.	Dialing sequence by Smart- modem ignored by your telephone system.	Dialing method not supported by your telephone system. OR	Determine if your telephone system uses pulse or Touch-Tone dialing. Change value on Configuration screen.
		Tones not long enough to be recognized by telephone system (tone dialing only).	Increase value of Touch- Tone Timing.
7.	Smartmodem not waiting for dial tone before starting to dial.	Dialing sequence starts before a dial tone is present.	Increase the value Wait For Dial Tone OR Insert a comma to cause a delay in the dialing sequence.
8.	You cannot hear the dialing through the Smartmodem's speaker.	Speaker Status on Configuration screen set to ALWAYS OFF. OR Volume turned down.	Change value on Configuration screen. Adjust volume by turning Volume Control knob.
9.	The number you dialed has been changed. Smart-modem hangs up before new number is given.	Insufficient time to hear message.	Increase value of Wait For Carrier Signal or dial manually.
10.	Program does not detect loss of carrier.	Code indicating loss of carrier, sent by modem, is not detected by Smartcom II. Program was performing a function (printing, displaying a file) when the message was sent.	Use menu option 0 , END COMMUNICATION/PROGRAM to release the telephone line.

Symptom/Indication		Possible Cause or Source	Recommended Solution
11.	The message "SMART-MODEM NOT RESPOND-ING" appears for boardlevel modems.	Smartcom II incorrectly identifies the communications port designated for the Smartmodem.	Select menu option 6. CHANGE CONFIGURA- TION, and change the com- munications port setting (COM I/COM 2). Check Switch 1 on Smartmodem 1200B for correct setting.
12.	Baud Rate on Parameters screen is changed automa- tically when Smartcom II answers a call at a different speed.	Smartmodem 1200 answers a call originated by a modem at 300 baud.	Decide in advance at what speed you wish to communicate.
13.	Carrier dropped suddenly without apparent reason.	Other system hangs up without notice. OR Carrier lost due to noise on the line. OR	Increase value of Carrier Loss To Hang-up Time on Configuration screen.
		Telephone line has "Call Waiting" feature and some- one has called.	Have "Call Waiting" taken off or use "Call Forwarding" to transfer calls.

Screen Display

Symptom/Indication		Possible Cause or Source	Recommended Solution
1.	Characters blink when displayed on screen.	Using DIRECT Character Processing, incoming data has 8th data bit set high. Remote system may be set for 7 data bits while your system is set for 8 data bits.	Change Data Format (Parameters screen) to a 7 data bit format. OR Use FORMATTED Character Processing to always clear the eighth data bit.
2.	A question mark (?) appears in incoming text but is not part of the data from the remote system.	One or more characters from the remote system were lost. Occurs when large amounts of text are received from a system that does not support the Stop/Start Protocol.	Transmit the data in small segments so that the amount of data sent does not exceed the capacity of the buffer.
3.	When on-line, two characters appear on the screen when one is typed from the keyboard.	Your system is set to HALF Duplex : remote system is set to FULL Duplex .	Change to FULL Duplex .
4.	When on-line, no characters appear on the screen when one is typed from the keyboard.	Your system set to FULL Duplex : remote system set to HALF Duplex .	Change to HALF Duplex .
5.	Lines of text appear double spaced.	Sending a text file containing carriage return and line feed characters. Remote system automatically inserting additional line feed after the carriage return.	Change setting of Include Line Feeds to YES to ensure that correct number of line feed characters are included.
6.	Each new line of data writes over the same line.	Character Processing set to DIRECT; remote system is not sending a line feed character after a carriage return.	Set Include Line Feeds to YES.

Sy	mptom/Indication	Possible Cause or Source	Recommended Solution
7.	Characters entered from your keyboard, while online, are not always displayed correctly. Occurs when using full-duplex.	Parity setting required by remote computer system.	Change Data Format to include either odd or even parity (as specified by remote system).
8.	When sending a file, characters are not displayed correctly on your screen.	Number of stop bits in Data Format is not the same for originator and answerer.	Change Data Format to include a different number of stop bits.
9.	When sending text to another system at 1200 bps, not all characters are displayed.	Remote system unable to handle incoming data at 1200 bps.	Increase the Characte r Delay and again transmit the file.
10.	Characters appear on screen with a caret in front of them or in reverse video.	Characters coming from remote system are control characters. Show Control Codes set to YES.	Change setting to NO if you do not wish to display control characters.
11.	Menu screen is displayed during file transfer process.	Confidential set to YES; incoming data is not displayed.	Change setting to NO if you wish to see incoming data. Menu remains displayed when transferring a file with the Verification Protocol, regardless of setting of parameter Confidential .
12.	Remote computer system not advancing to new line: display of data on your screen is correct.	When Character Processing is set to FORMATTED, display of data on your screen includes line feeds when necessary. Remote system not including line feed character after receiving carriage return.	Change Include Line Feeds to YES.

13. Screen is blank, either when starting Smartcom II. or after setting the Monitor and Adapter value on the Configuration screen.

Your system contains a display adapter to which no monitor is attached.

Attach a monitor to the display adapter

OR

If you have not pressed any other keys:

- 1. Press 0 (zero), wait approximately five seconds and press the E
- 2. At this point the system prompt (A>) should reappear.
- 3. Check that SCOM.DAT and SCOMFIX.EXE are on your Smartcom II disk.
- 4. When the A > prompt is displayed, insert Smartcom II disk into Drive A.
- 5. Type **SCOMFIX** and press Return.
- 6. After system prompt A > appears, load the Smartcom II program. OR
- 1. Turn off system and wait five seconds.
- 2. Turn on power and reboot system using DOS operating system.
- 3. Check that SCOM.DAT and SCOMFIX.EXE are on your Smartcom II disk.
- 4. When the A > prompt is displayed, insert Smartcom II disk into Drive A.
- 5. Type SCOMFIX and press Return.
- 6. After system prompt appears, load the Smartcom II program.

14. Emulator not working. Screen filled with unintelligible characters, sometimes intermixed with good data

Configured for wrong emulator in parameter set of selected Communication Set

OR

The host system is not sending the proper control sequences to Smartcom II. Note: Smartcom II ignores unimplemented control sequences and does not display them on the screen.

Telephone line connection is "noisy."

Verify that the Emulator parameter in the active Communication Set matches that of the host computer.

If host computer can use a different emulator type, coordinate matching emulators, or conversely, change Smartcom II emulator type.

Redial or try a different telephone line. If the emulator fails at only one location. the telephone lines should

be suspected.

OR

If all other remedies fail. check the application program to assure that no nonstandard or unimplemented control sequences are sent to the Smartcom II emulator.

15. Emulator works properly until one or more Smartcom II internal operations are performed, then on-line screen characters become scrambled

If the **Emulator** parameter or the Show Status Lines parameter are changed while Smartcom II is online, the emulator internal variables may be set to a state not selected by the applications program.

Verify that the parameters in the current Communication Set are set correctly. If possible, have the host system redraw the terminal screen. If the problem persists, exit the applications program and try again. Be sure not to modify the Communications Set parameters while on-line.

Symptom/Indication		Possible Cause or Source	Recommended Solution
16.	When using an emulator, the screen sometimes rolls unexpectedly or is otherwise displayed incorrectly when 1) the cursor is at the bottom of the screen and 2) status lines are displayed.	The emulator display exceeds 22-line display limit when status lines are displayed. When status lines are active, the screen is limited to 22 lines instead of 24. Cursor addressing in lines 23 and 24 when status lines are active will cause screen to become scrambled.	Turn the status lines off when using an emulator with this application.
17.	Special function keys and arrow keys do not initi- ate normal Smartcom II functions.	Keyboard functions differ when you use VT102/VT100 or VT52 emulators.	To enable the Smartcom II functions, press the "Switch Key" (the Scroll Lock key on the IBM PC).
18.	When scanning through the buffer storage memory, character sequences that only vaguely resemble what was shown on previ- ous screens appear.	What you observe is not a problem, but an aspect of using the buffer along with screen-oriented applications.	Avoid using the buffer storage with screenintensive applications, unless you are debugging and have set the Show Control Codes parameter to Yes .

Printer Output

_			
Symptom/Indication		Possible Cause or Source	Recommended Solution
1.	Output not legible.	Baud rate selected for serial printer does not match actual printer speed.	Change value of Printer Baud Rate on Configuration screen.
2.	Printer status, displayed on Status Line, always reads "BUSY."	If you are using a serial printer, printer protocol selected is incorrect.	Change value of Printer Interface on Configuration screen.
		Channel between printer and computer is not active.	Make sure the printer is ready to receive data.
3.	Characters from file are not printed.	If using a serial printer, protocol selected is incorrect.	Change value of Printer Interface on Configuration screen.
4.	Printer indicates an error condition. Program does not show "BUSY" status.	If using a serial printer, protocol selected is incorrect.	Change value of Printer Interface on Configuration screen.
5.	Message "Printer:WORK" displayed but no characters are being printed.	If using a serial printer, protocol selected is incorrect.	Change value of Printer Interface on Configuration screen.
6.	Printer works correctly for short period, then stops Status message "BUSY" appears	If using a serial printer, protocol selected is incorrect.	Select ETX/ACK Protocol for Printer Interface .
7.	Text is double spaced.	Printer inserting a line feed character after each carriage return received. Line feed character in the file is also being processed by the printer.	Set Remove Line Feeds to YES (Configuration screen).
8.	Question marks appear in incoming text but are not part of the data from a remote system.	Incoming data is lost because remote system does not support the Stop/Start Protocol.	Transmit the data in small segments so that the amount of data sent does not exceed the capacity of the buffer.

Sy	mptom/Indication	Possible Cause or Source	Recommended Solution
9.	Printer unexpectedly changes printing methods (such as enters graphics mode) or indicates an error condition.	Character Processing is set to DIRECT: incoming con- trol codes are being sent directly to the printer.	Change Character Processing to FORMATTED.
10.	Characters at beginning or end of line are out of place or missing.	Printing attempted while paper is scrolling upward. Need small delay after each line so that paper is positioned correctly before printing the next line.	Increase value of Add NULs on Configuration screen. Three or four nul characters are generally sufficient.
11.	Printing on page folds.	Character Processing set to DIRECT. OR Paper not started at top of form.	Change Character Processing to FORMATTED. Reset printer.
12.	Printer does not turn off when Printer Key is pressed.	The buffer contains data not yet printed. Printing continues until buffer is cleared of all data added until the Printer Key is pressed.	Select menu item 7 CHANGE PRINTER STA- TUS. Again turn printer ON: any data still in the buffer is lost. Printing stops.
13.	Setting menu option CHANGE PRINTER STATUS to ON causes printing to stop. Status line becomes blank.	If CHANGE PRINTER STATUS turned OFF then ON, printer buffer is cleared.	Must set CHANGE PRINTER STATUS to ON a second time to start printing.
14.	Error message appears: "Selection Not Available:"	Printer Interface on Configuration screen set to NO PRINTER.	Change value on Configuration screen if you have connected a printer to your computer.
15	Error message appears: "Selection Not Available While Printing."	Certain Smartcom II functions are not available while printing.	Discontinue the printing or wait until it is completed before making your selection.

Keyboard

Sy	mptom/Indication	Possible Cause or Source	Recommended Solution None
1.	The keyboard Escape Key is performing the same actions as the defined Escape Key, even though the latter is set to a different value.	When not on-line, both the keyboard Escape Key and the defined Escape Key may be used to perform the same actions. Once on-line, only the defined Escape Key is recognized.	
2.	Help Key not working with CREATE FILE.	Help information not available when creating a file with DIRECT Character Processing.	Select FORMATTED Character Processing when you need help.
3.	Newly selected value for Help Key not being recognized by program.	New values are not put into effect until you leave the Parameters screen.	Display the menu: redisplay the Parameters screen. New value for the Help Key is then displayed in top right corner of the screen.
4.	Tab characters replaced by spaces.	Using FORMATTED Character Processing.	If you wish to include tab characters in the file, select DIRECT Character Processing.
5.	Cursor does not move to new line when carriage return key is pressed.	Using DIRECT Character Processing line feed character is not automatically included by the program after the carriage return.	Use FORMATTED Character Processing. OR Follow each carriage return with CTRL-J.
6.	Remote system not responding to break signal.	Break Length not long enough	Increase value of Break Length on Parameters screen.
7.	When you press the space bar to set a value to a space (Parameters, Macro Definition, and Configuration screens) an unexpected value appears.	The space bar is used by the program to recall the recommended or default value for each variable item on the screens.	To select a space, use the left or right arrow keys to reach the ASCII value or directly enter the ASCII decimal equivalent for a space (32).

Files

Symptom/Indication		Possible Cause or Source	Recommended Solution
1.	Up arrow does not allow you to move to beginning of file (CREATE file, FOR-MATTED Character Processing).	You may only return to previous lines of text still stored in memory. Once recorded on disk, data cannot be edited.	None
2.	Blank lines at end of text file are not recorded on disk (CREATE file, FOR- MATTED Character Processing.	Data lines at the end of the file that do not contain any characters are not recorded on disk.	Create blank lines by entering a space followed by a carriage return character.
3.	Control codes in the file are not shown.	Using FORMATTED Character Processing.	Change Show Control Codes to YES.
4.	When in Remote Access, you cannot display the entire Disk Directory of the remote system.	The remote system has more file names than can be stored on your disk.	None, unless you make available more disk space. The Disk Directory is sent from the remote system with an Error-Free Pro- tocol. As much information is stored on your disk as space permits.
5.	When in Remote Access. RENAME or ERASE file appear to occur, but the original file is later found to exist.	Action was performed on the remote rather than the local disk.	Temporarily set SELECT REMOTE ACCESS to OFF to erase or rename local files; then, turn it ON again.

File Transfer

Symptom/Indication		Possible Cause or Source	Recommended Solution
1.	While receiving a file with the Stop/Start Protocol, question marks appear in text.	Incoming data is being lost because the remote system does not support the Stop/Start Protocol.	Transmit the data in small segments so that the amount of data sent does not exceed the capacity of the buffer.
2.	While sending a file, a slight pause occurs after each carriage return.	The Include Line Feeds parameter is set to YES. The program waits for a line feed to be echoed from remote system before sending a line feed.	If a line feed is not being sent from remote system, change entry to NO.
3.	When using the Send Lines Protocol, each line of the file is sent before the remote system's prompt is received.	Send Time-out value too low.	Increase Send Time-out value.
4.	Prompt character from remote system is not recog- nized. Program waits until Send Time-out elapses before sending next line.	Prompt Character defined on Parameters screen does not match prompt character used by remote system.	Use DIRECT Character Processing and set Show Control Codes to YES to determine the correct Prompt Character.
5.	While receiving a file, each line of text is being written on the same line.	File being sent does not include a line feed character after each carriage return. OR If the receiving computer answered the call, and Include Line Feeds is set to	Change Character Processing to FORMATTED. Set Include Line Feeds to NO on the answering computer.
		YES, a line feed is never sent by the originating computer.	OR Set Character Processing to FORMATTED.

Syr	nptom/Indication	Possible Cause or Source	Recommended Solution
6.	The RECEIVE FILE command terminates before the complete file is received.	The sender stopped the transfer. OR	None
		The sender paused for some reason and your computer reached the Receive Time-out value.	Set Receive Time-out to a higher value.
7.	File being sent with Stop/Start Protocol appears to be missing characters or to contain unwanted characters.	The receiver does not support Stop/Start Protocol.	Transmit the data in small segments so that the amount of data sent does not exceed the capacity of the buffer.
		OR Stop and Start Characters defined on your Parameters screen do not match those of the receiver.	Change values for Stop and Start Characters to match those of the receiver
		OR File being sent contains control codes.	Use an Error-Free Protocol.
		OR Receive using an Error-Free Protocol.	Both sender and receiver must agree on which protocol to use.
8.	When transferring a file using the Stop/Start Protocol, the program is not responding to the Stop or Start Characters.	Stop and Start Characters are not the same on both systems.	Change the values on the Parameters screen.
9.	After receiving a file, the program waits a long time before terminating the transfer.	Receive Time-out value on Parameters screen set too high.	Adjust value for Receive Time-out on Parameters screen.
10.	Text being received duplicates the first portion of the text file already received.	Sender is using an Error-Free Protocol: receiver is using the Stop/Start Protocol. Since the sender did not receive an acknowledgement mes- sage, the block of data is again transmitted.	The sender and receiver must agree on which protocol to use.

Macros

Sy	mptom/Indication	Possible Cause or Source	Recommended Solution
1.	Macro Data line sent before remote system ready. OR Remote system waiting for next Macro Data line: long pause occurs before line is sent.	Prompt Character defined for the Macro Data line does not match prompt character sent by remote system.	Set Character Processing to DIRECT and Show Control Codes to YES to determine correct Prompt character. Enter this character on Macro Definition Screen.
2.	Nothing happens when you press the Macro Prefix Key and the Macro label.	Macro label entered does not correspond to a defined Macro.	Be sure to select the correct label.
3.	Blank lines at end of Macro are not transmitted.	Each macro Data line must contain at least one character.	Enter $\wedge M$ in the Data line; set Send CR to NO.
4.	When you begin the program this message appears: "SCOM.DAT has XXK of unused space because of erased Macros. Do you want to compress the data file? (Y/N)" (where XX is the number of kilobytes).	Erasing Macros does not automatically reduce the size of the data file.	Compress the data file to obtain more disk space.

Batch Sets

Sy	mptom/Indication	Possible Cause or Source	Recommended Solution
1.	Undesirable resets or calls occur when your computer automatically loads and runs Smartcom II.	Batch Set Z contains commands which cause Smartcom II to be aborted or take other unwanted actions.	As soon as Batch Set Z playback starts, press Escape Key to abort playback, then erase or modify Batch Set Z.
2.	Playback of Batch Set did not perform as desired.	During Batch Set recording, you entered keystrokes while the remote system was sending characters.	Be sure that the remote system has finished sending characters before entering additional keystrokes. If you are not sure as to the remote system's responses. check the prompt/response sequences online before recording the Batch Set.
3.	File capturing process does not perform properly when in Batch Set playback mode.	During Batch Set recording session you used the Escape Key to stop the recording process.	Allow the file capture Timeout to finish before entering any other commands. The Timeout value is set on the Parameter screen.
4.	Playback occurs at the wrong time.	 Correct time is not set on computer. Your system uses CP/M-86 operating system and you have not entered "absolute" time for chained Batch Sets 	Exit Smartcom II and enter correct time. Refer to CP/M-86 time setting procedures in Chapter 4. "Batch Command Sets—Playing Back Your Own Batch Sets."
5.	Your system displays two passwords, two telephone numbers, or two Batch Set Names	You recorded a password, telephone number, or Batch Set name during the recording sequence without pressing CTRL-X before entering each. This causes the old and new data to be played	Press CTRL-X before entering password, telephone number, or Batch Set name.

in sequence.

6. Errors occur during playback of a Batch Command. Program beeps and exhibits erratic actions. Initial conditions are not the same during playback as they were when the Batch Set was recorded. For example, if you recorded the sequence IOA while the telephone was hung up. and played the Batch Set back with the telephone off-hook, the "1" command could not be executed. Instead. Smartcom II executes OA...and the remaining keystrokes as main menu commands.

Be sure that the environment at playback is the same as when the Batch Set was recorded. Avoid editing Parameters, Configuration, and Macros in a Batch Set.

 Printer does not always turn on when programmed to do so, or it turns on at the wrong time. Initial condition of printer key toggle (ON or OFF) was not the same as during playback of Batch Set. Be sure that the printer is in the same state (On/Off) as it was when the Batch Set was recorded.

8. Batch Command turned on printer, but printer was busy (out of paper), keeping data from being printed.

When the printer is busy and the data buffer is 80% full, the printer sends a signal to Smartcom II. If these conditions persist for two minutes, Smartcom II assumes that the printer will stay busy, and sends $\land Q$ to resume data transfer. This allows continuation of the Batch Set processing.

When leaving your system unattended in playback mode, be sure that the printer has sufficient paper to complete the required printing.

 Batch Set does not execute a command, particularly after you have erased a file. When you recorded a batch set, the file existed. If that file does not exist when you play back the same Batch Set, the file commands are ignored. Smartcom II then proceeds to the next main menu.

Start all command sequences from the main menu.

Possible Cause or Source	Recommended Solution	
When the Batch Set was recorded, the command sequence was not terminated, causing the remote system to stay on-line. Next Batch Set played could not be executed.	Be sure to finish each Batch Set command sequences with a 0 (zero), End Communication/Prgram.	
When Smartcom II is loaded, Batch Set Z is played automatically if it is defined. If the Smartmodem is not available, the error message is displayed. Pressing the defined Escape Key to continue Smartcom II will cancel playback of Batch Set Z.	Verify that Smartmodem is available at all times to assure that Batch Set Z will be played.	
When Smartmodem II is dialing or waiting for a response and you press the defined Escape Key . Batch Set recording is cancelled. OR When Smartcom II is send-	Response is correct. Restart recording process if desired Response is correct. Restart	
ing files and you press the defined Escape Key. Batch Set recording is cancelled. OR When Smartcom is sending a Macro and you press the defined Escape Key. Batch Set recording is terminated.	recording process if desired Response is correct. Restart recording process if desired	
	When the Batch Set was recorded, the command sequence was not terminated, causing the remote system to stay on-line. Next Batch Set played could not be executed. When Smartcom II is loaded, Batch Set Z is played automatically if it is defined. If the Smartmodem is not available, the error message is displayed. Pressing the defined Escape Key to continue Smartcom II will cancel playback of Batch Set Z. When Smartmodem II is dialing or waiting for a response and you press the defined Escape Key. Batch Set recording is cancelled. OR When Smartcom II is sending files and you press the defined Escape Key. Batch Set recording is cancelled. OR When Smartcom is sending a Macro and you press the defined Escape Key. Batch Set recording is cancelled. OR	

Error Messages

The following is a complete list of Smartcom II error messages. Each error message is shown in bold type, followed by the reason for the message and the corrective action you should take. When more than one reason or action is identified, the most likely item is presented first.

Batch Playback Canceled! Press ... To Continue or Batch Record Canceled! Press ... To Continue

Batch playback or record mode has been canceled for one of the following reasons:

- You pressed the Escape key
- Carrier lost
- Fatal disk error
- Remote Access transfer error
- Error-free file transfer error (at remote system)

Press F1 to continue Smartcom II operations. If you did not intentionally terminate the mode, retry your batch playback or record action. A repeated failure indicates either a termination at the remote system or a fatal disk error. If you determine that the error is in your disk, restore from backups.

Batch Set Not Defined

You have attempted to play back an undefined batch set; define the set and restart the process.

Carrier Lost

This message informs you that conditions external to Smartcom II have disrupted communications between you and the remote system. Press F1 to return to the Main Menu, and reinitiate communication or choose another operation.

Command Canceled Receivers Disk or Directory Full

You cannot perform the desired command until the remote user has taken steps to free up space on his system's diskette or directory, or until he has inserted a diskette with ample space.

Directory Full Press ... To Continue or Disk Full Press ... To Continue

This error message disappears when you press the defined key, but you should be aware that your directory for diskette has no available space left. Eliminate anything not needed on the diskette, or switch to a diskette with more available space.

Error—System Unit 1101 or Error—System Unit 1201

This message requires no action on your part. The diagnostics program was not written to recognize a Smartmodem 1200B; therefore, when the diagnostic program goes out to the communication port for the Smartmodem 1200B, this message appears.

Exceeding Max Number of Keystrokes! Press ... To Cancel

The maximum number of keystrokes per Batch Set is 500. You have exceeded that number, causing processing to be terminated. Press defined key, and re-enter the keystrokes—but do not exceed 500.

File Error Press ... To Continue

A file name usually appears on the status line above this message. The error message will disappear when you press F1, and Smartcom II will terminate if a fatal file error is involved. If a file name appears on the status line above this message, the file may have become corrupt; exit Smartcom II and follow standard DOS procedures to restore the file from your original disk or backup. If no file name appears, you may have a damaged disk and need to restore the entire set of SCOM files.

File Exists Press ... To Continue

You have attempted to use a file name that already exists on the diskette; or a write-protect tab covers the diskette's readonly slot. Press defined key and choose another file name.

File Is Read-Only Press ... To Continue

You have not made a copy of the Smartcom II program; read the Smartcom II installation instructions provided with your Smartcom II manual for proper copying procedure.

File Not Found Press ... To Continue

You have either entered the file name incorrectly, or the file you have specified is not on the diskette. Press defined key to continue Smartcom II operations; check to see that you have entered the correct file name or have inserted the correct disk, and re-enter the file name or insert the correct disk as needed.

Help Unavailable X:SCOM.HLP Not On Disk

The file SCOM.HLP was either not copied from your original Smartcom II diskette to your working copy, or the copied file has become damaged. Follow standard DOS procedures to copy SCOM.HLP from the original program diskette to your working copy.

Log In Not Accepted: Invalid Password

You have entered an invalid password while accessing Smartcom II during Remote Access. Check to see that you have entered the password correctly; if you have not been given a valid password, you cannot access Smartcom II at this time.

Log In Not Accepted: System Not Recognized

The conditions for this error message are the same as for the message above.

Macros Not Permitted

You cannot use Macros with Communication Set Z.

Not Enough Memory

This message can appear only when you are loading the Smart-com II program, and means that your computer does not have enough memory for Smartcom II. Smartcom II requires a minimum of 128K memory for operation.

Receive Canceled Receivers Disk or Directory Full

You must either eliminate space on your diskette or directory, or must insert another diskette with ample space available before receiving this transmission.

Reserved File Name

You have entered a file name reserved for system use. To proceed, enter another name.

Selection Not Available

You have made a menu selection not available at this time (such as selecting 4. Send File when you have not yet established communications, or selecting 3. Change Configuration when online with a remote system). Refer to the appropriate section of the User's Manual for the proper steps involved in the operation you have chosen.

Selection Not Available While Printing

You must wait for printing to finish before choosing this operation; no other response is required. If you are not printing, select 7. Change Printer Status and set the value to **OFF**.

Send Canceled Block Re-try Count Exceeded

This message occurs when Smartcom II has retried sending a file, after repeated errors, for the eighth time. The problem lies at the remote system and cannot be corrected from your terminal.

Send Canceled Block Time-out Count Exceeded

The remote system was looking for a reply which it never received from your system. Try sending again; if this does not succeed, it may be that the remote system has become temporarily inoperative.

Send Canceled Carrier Lost

Conditions external to Smartcom II have disrupted communications between you and the remote system. Press **Escape Key** to return to the Main Menu; from there you may reinitiate communications and restart the send process, or choose another option.

Send Canceled Other System Canceled

The file transfer has been terminated at the remote system (user pressed **Escape Key**, etc.).

Send Canceled Receivers Disk or Directory Full

You cannot send data to the designated receiver until the remote user has taken steps to free up space on his system's diskette or directory, or has inserted a diskette with enough empty space to receive the data.

Smartmodem Not Responding. Check Modem.

Your Smartmodem is not responding to Smartcom II for one of the following reasons:

- You have installed the Smartmodem on a Communications Port (COM1 or COM2) other than the one specified on the Configuration screen.
- You have not turned the Smartmodem on (free-standing modems only).
- Your Smartmodem is not installed with the proper cable configuration (free-standing modems only). If you have a board-level modem, or have a free-standing Smartmodem that is turned on and properly cabled according to instructions in the Hardware Reference Manual, you probably have installed the Smartmodem on COM2. Either re-install the Smartmodem on COM1 or follow the steps given for the error message below to reassign to COM2.

Smartmodem Unavailable

This message appears in the status line during a Smartmodem Not Responding message. The IBM PC has two Communication Ports, designated COM 1 and COM 2 by MS-DOS. In your case, the Smartmodem is not at the port Smartcom II expects. Your Smartmodem (if you have a 1200B) and Smartcom II are both factory-set for COM1; you may already be using COM1 for another purpose. To correct the problem:

- 1. Set Configuration Switch 1 on your Smartmodem to the OFF position (see CONFIGURATION SWITCHES in Chapter 2 of the Smartmodem Manual).
- 2. Choose option 6 from the Smartcom II Main Menu, then change the Communications Port to COM2.

Standard Values May Not Be Changed Press ... To Continue.

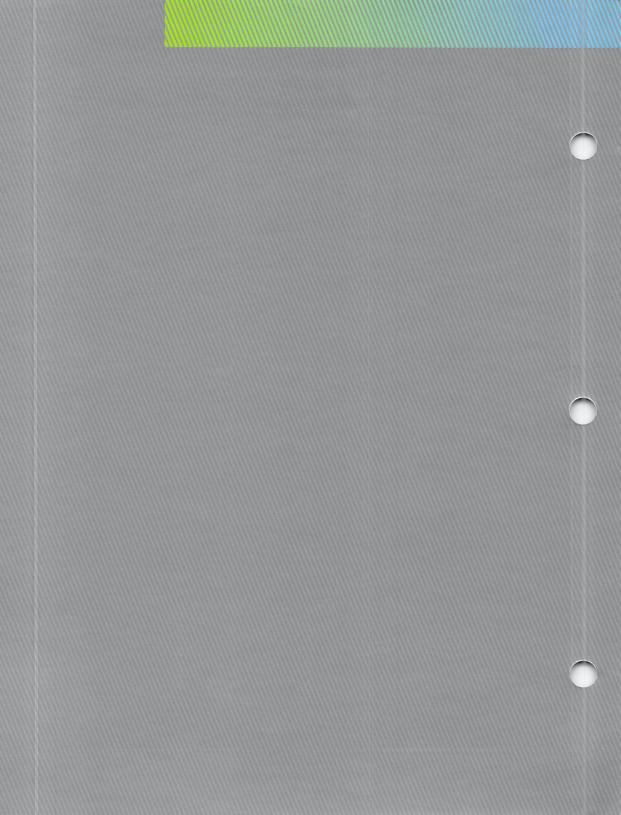
You cannot change the parameters on Communication Set Z.

X:SCOM.CRT Screen Driver File Not Found or X:SCOM.DAT Configuration File Not Found or X:SCOM.OVR Overlay File Not Found

The SCOM file identified in the error message was either not copied from your original Smartcom II diskette to your working copy, or the copied file has become damaged. Exit Smartcom II or restart the computer and follow standard DOS procedures to copy the identified SCOM file from the original program diskette to your working copy.

8 Communications Primer

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Scenarios

- The publications department of a life insurance company uses a word processor to edit the final draft of a new employee handbook. When finished, a typist calls a publishing firm and then uses the telephone lines to send to it the text of the new publication.
- Two teenagers, home from school in Kansas and Connecticut, use family microcomputers to play a game of chess over the telephone lines.
- A corporate executive issues a memo to supervisors at all company sites by sending a message, over the telephone lines, to each supervisor's desk-top microcomputer—before the supervisor returns from lunch.
- A biomedical researcher in Louisiana calls a bibliographic retrieval service in Washington, D.C. He then uses his terminal to search a data base for all articles published this month on a particular virus.
- A businesswoman in Texas uses her microcomputer to retrieve daily stock quotes, analyze them, and leave the results of her calculations for a client in Nevada—in his electronic mail box at an information service in Virginia.
- A field representative for a chemical company sets up his home microcomputer to answer incoming computer calls during his absence. Special software keeps a log of callers so that he can return the calls later that day.

In all of these scenarios, a modem is used to make possible the exchange of information between remote computers.

A modem enables computers and terminals to communicate with each other by sending signals over the telephone lines. These signals may represent information of any kind.

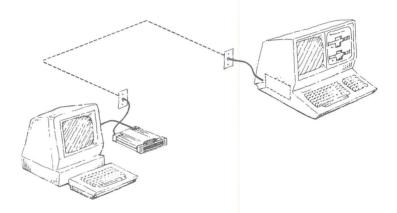
By using a modem to reach another computer, you use the network of telephone lines already in place for voice communication. You extend the capabilities of your own computer and gain access to information stored at remote locations. The applications for remote communication are extensive and varied.

This chapter introduces you to the basics of data communication and to the role modems play in making remote communication possible. The information presented here acquaints you with the design and operation of modems and with the essential technical vocabulary of the subject. Throughout, the topics discussed are related to characteristics of the Smartmodem and to various operating parameters and special values that you may change through Smartcom II.

Applications

Micro to Micro Communications

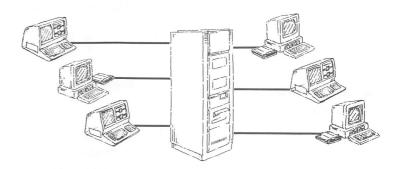
Hobbyists and professional microcomputer users communicate with each other, via modems, to transfer data, to share programs, and as an alternative to voice communication. With software such as Smartcom II, certain applications can be performed by the computers while unattended.



Microcomputer Networks

Modems are installed by businesses of all types to create networks of company microcomputers and to permit access from remote sites for transmitting mail. transferring sales reports and orders, for editing documents, and for other functions.

Bulletin Boards & Other Electronic Message Systems Microcomputer owners also participate in electronic message systems, such as bulletin boards, that allow users to post notes or advertisements, maintain "post office boxes," and perform other activities for business purposes or entertainment.



Special Services, Time-sharing, Information Utilities Modems are also used by various institutions and individuals to permit bibliographic retrieval, on-line ordering of products, answering services, remote banking, access to scientific or technical information, and many other uses.

Modems are installed by student computer users to access their university computing centers, and by businesspersons seeking access to corporate and commercial time-sharing services. Time-sharing allows remote terminals or microcomputers, active at the same time, to share the power and data storage capability of large-scale computers for retrieving files, running programs, and performing calculations.

The companies called "information utilities" or "information services" also provide, on a fee basis, access to data that is stored and regularly updated at a central location. These companies, as discussed in Chapter 9, aim to simplify and improve daily business by providing news and stock information, an index to other published information, and services such as automated shopping and travel reservations, message systems for contacting other users, and access to business and accounting calculations. The information utilities and time-sharing systems are reached through special communications carriers that route data, also as noted in Chapter 9.

Tymnet, Telenet, and Uninet are two telecommunications networks especially dedicated to computer communications. Carriers dedicated to a special purpose such as data communications are called value-added carriers because of the message processing, error detection and correction, and other specialized services they provide. These networks are not normally noticed by information utility users, but they function in very special ways to connect digital communications systems.†

Establishing a Connection

To establish a connection between two remote computers via the telephone lines, one modem originates a call to another compatible modem. When the second modem answers the call, the modems exchange signals (tones) that allow a data communications connection to be made.

Industry standards specify which tones to send to **originate** and which tones to send to **answer** a data communications call. Two modems set to originate a call cannot reach each other since both would transmit the same signal on the same channel and neither would be ''listening.''

The information utilities, electronic mail services, bulletin boards, and time-sharing systems are established as answer-only applications so that you may originate a call to them; some modems are designed only to answer calls. When two microcomputers wish to communicate, however, the users must decide which modem will originate and which will answer the call.

The Smartmodems originate and answer calls: they perform automatic dialing and automatic answering. The Smartmodem automatically dials the number and performs the sequence of actions that establish a connection. To answer a call, you may set a Smartmodem switch (free-standing modem only) or issue a command so that the Smartmodem automatically monitors the line for a ringing signal.

†Frank J. Derfler, *Microcomputer Data Communications Systems* (Englewood Cliffs, NJ: Prentice-Hall, 1982), p.6.

The Modem's Basic Function

For computer processing data must be expressed in numerical form. The binary number system is used so that each character (letter, number, or symbol) may be expressed as a special sequence of the binary digits (or bits) 0 and 1.

For example:

A = 01000001

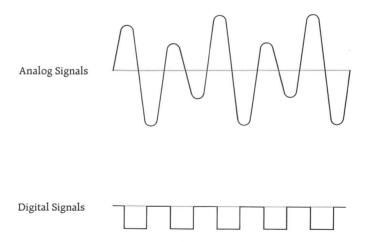
B = 01000010

C = 01000011.

The 8 bit numerical equivalent shown above is called a **byte** of data.

To transfer data bit by bit, a device need only be capable of representing two numbers (0 and 1).

However, digital microcomputers generate and use **digital signals**, whereas the telephone system transmits only **analog signals** as tones. The computer's digital signals occur as two distinct states (0 or 1, OFF or ON). The analog signals vary continuously.



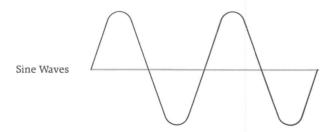
A modulator is used to convert digital signals into analog signals and a demodulator to reconvert the signals for the computer or terminal connected to it. A modem performs both the modulator and demodulator functions; the word "modem" is a contraction of MOdulate-DEModulate. To communicate, both ends of a line must be equipped with a modem and certain characteristics of the modems must be alike.

Compatibility between modems is determined by design and operating characteristics, such as the frequencies at which the modems transmit, the signaling techniques they use, and the transmission speeds of which they are capable. The fundamental characteristics of modems are described below.

The Carrier Signal

The signals exchanged by modems are referred to as **carrier signals**—continuous audible tones, at predetermined frequencies, used to carry information over the telephone line. Whenever the carrier signal disappears, the connection is broken between the modems.

Electronic signals for transmission on communication lines are generated as sine waves.



The sine wave proceeds over time from a zero level, to a positive value, then to an equal negative value, and back to zero. The more cycles per unit of time, the higher the frequency of the signal.

Transferring Information

Information is transmitted by altering the carrier signal. The representation of digital information (the binary "one" and the binary "zero") requires only two states. Therefore, digital information may be transmitted by the carrier signal by altering the signal one way to represent one state and another way to represent the other state. The change is accomplished by a technique called **modulation**.

The three types of modulation of the sine wave signal change either its **amplitude** (magnitude or voltage level). **frequency** (number of complete oscillations of the signal per unit of time), or **phase** (location at which a signal crosses the zero level, relative to the previous signal).

The Smartmodem 300 uses a type of frequency modulation called **frequency shift keying (FSK)** for modulating the low speed signal (110 and 300 bps). The Smartmodem 1200 uses the same technique for low speed communication but uses a type of phase modulation called **phase shift keying (PSK)**. for modulating a high speed signal (1200 bps).

At the low speed, the carrier signal is modulated between different frequencies to represent 0 and 1, as shown in the table below.

Low Speed Carrier Frequencies (in Hz†)

		1	0
ODIGINATE	Transmit	1270	1070
ORIGINATE	Receive	2225	2025
	Transmit	2225	2025
ANSWER	Receive	1270	1070

†The abbreviation "Hz," for hertz, expresses the number of cycles per second.

Similarly, the high speed carrier signal transmits at one frequency and receives at another; however, a 0 or a 1 is indicated by a change in the phase of the steady signal.

High Speed Carrier Frequencies (in Hz +/-.01%)

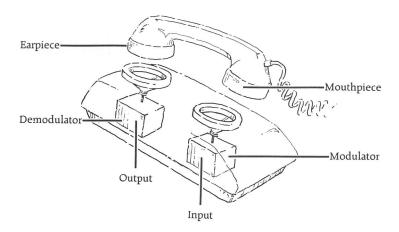
ODIGINATE	Transmit	1200
ORIGINATE	Receive	2400
ANGIATED	Transmit	2400
ANSWER	Receive	1200

The modulation technique used by a modem cannot be changed.

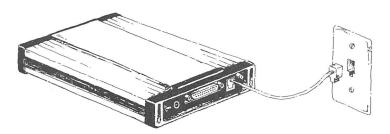
Modem to Telephone Line Communication

Modems connect with the telephone lines in one of two ways. They are either acoustically coupled or direct-connection devices.

An acoustic coupler is designed so that the telephone handset (used for voice communication) may be placed into special cups on the modem. The mouthpiece on the handset is then adjacent to the modulator and the earpiece is adjacent to the demodulator.



The incoming and outgoing signals are converted by the modem from/to audible tones. The direct connection devices perform the same modulation/demodulation: however, they are connected directly to the telephone jack by a wire that bypasses the telephone.

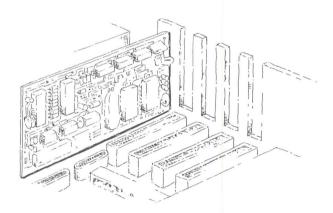


The direct connection results in a modem with lower sensitivity to noise than that experienced with acoustic couplers.

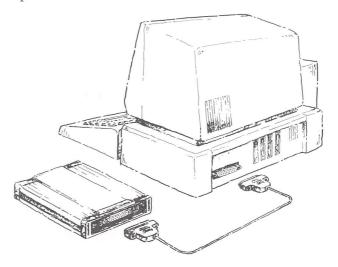
The Smartmodems are direct-connect modems: a telephone cable is provided to connect the modem to a standard telephone jack. The Smartmodems are approved by the Federal Communications Commission for direct connection to any telephone system in the United States.

Modem to Computer Communication

Besides the connection of the modem to the telephone system, another connection is made between the modem and the local microcomputer. The board-level Smartmodem is a printed circuit board that fits into an expansion slot on the computer's system board. The modem becomes a part of the computer; power and information are transmitted to the modem directly through the computer's circuitry.



A freestanding Smartmodem communicates with the local computer via a connection referred to as an RS-232C port. The port accommodates a cable with a DB-25 connector; it is used to join the RS-232C port on the back of the modem to that on the computer.



RS-232C is the number of a standard developed by the Electronic Industries Association. This standard is often used to interface computers with data communications equipment.

Communication Software

To manage the transfer of data from the computer, through the modem, over the telephone lines, and back again, communications software must be active on the computer or within the modem. A communications program is permanently coded as firmware in the read-only memory of the Hayes Smartmodem. This firmware provides the modem with a simple command set that performs limited communication functions. For Hayes Smartmodems, the firmware commands may be issued from the keyboard (through BASIC language) or through a program running on the computer.

To transfer information from a computer's disk drives or to its printer, for example, more advanced software is required. For Hayes Smartmodems, this software is Smartcom II. It offers a full range of features for managing communication while operating with any of three standard operating systems. It provides protocols and variable parameters for sending, receiving, and storing information.

Parallel vs. Serial Transmission

The board-level Hayes Smartmodem transmits data over the telephone line bit by bit, but transmits data to the local computer eight bits at a time. The bit by bit method of transmitting data is called **serial transmission**: only a single channel is necessary to maintain communication. Serial transmission is contrasted to **parallel transmission** which uses multiple channels to transmit simultaneously several bits of data. The freestanding Hayes Smartmodem transmits data over the telephone line and to the local computer bit by bit.

The communication line between a computer and a printer, for example, may be either a serial or parallel connection. This connection determines which printers are compatible with which computers, since not all equipment accommodates both types of transmission. By performing special processing, Smartcom II transmits data to a printer that is either of the parallel or serial type.

The communication line between the computer and printer, for example, may be either a serial or parallel connection. This connection determines which printers are compatible with which computers, since not all equipment accommodates both types of transmission.

Data Format

Before discussing additional communication concepts, it is necessary to review the nature of computer data.

The binary digits or bits are organized into special sequences that represent characters of a complete character set. The standard character set and coding scheme used is called the **ASCII** set, American Standard Code for Information Interchange. It is a seven bit code that represents numbers, letters, symbols, and special **control codes**. A control code is a non-graphic character which controls an operation such as the carriage return, clear screen, backspace, or bell.

ASCII code essentially signifies how many times and when a voltage or tone goes high or low in a seven-bit sequence. The capital letter A, for instance, has a coding of 1000001. This would be coded over a piece of wire by sending one negative voltage...five positive voltage pulses, and a final negative voltage pulse within certain time slots set by internal clocks in the equipment. Over a telephone line, the direct current voltages would be converted to audio tones by a modem....This coding is also a number in the binary (base 2) number system. If the binary value is converted to the decimal (base 10) number system, it becomes 65. This coding...always represents A and it always has a decimal value of 65 in the ASCII alphabet.†

The ASCII Character Table is reproduced at the end of the Glossary.

For transmitting data over the telephone lines, more bits may be added to the seven bit character for special purposes. An optional parity bit may be added for a parity check, a method of error detection. A system may use either odd or even parity. When odd parity is selected, the transmitting device counts the number of ones in each ASCII character; if the total is not an odd number, the parity bit is made to equal one and thus produce an odd number. Following transmission, if the receiving device counts an even number of ones, an error in transmission has occurred. The same procedure is followed for even parity; an even number must result from the calculation performed at both ends of the line.

†Frank J. Derfler, *Microcomputer Data Communications Systems* (Englewood Cliffs, NJ: Prentice-Hall, 1982), p.10.

Furthermore, **stop** and **start bits** may be added to indicate the beginning and end of each character. The start bit, a logical 0, tells the receiving system that the following bits comprise an ASCII character. After the ASCII character and optional parity bit are sent, one or more stop bits may be transmitted to define the end of one character before the beginning of the next. At lower transmission speeds, two stop bits are often used; at higher speeds, only one.

Smartcom II is set initially to transmit data in the format of 1 start bit, 8 data bits, no parity, and 1 stop bit. The program performs an alternate method of error checking and does not make use of the parity bit. However, through the program, you may select an alternate standard combination of data bits, stop bits, and parity bits, when required for communication with a system that uses a different format.

Synchronous vs. Asynchronous Transmission

The transmission of data may be performed in one of two ways. asynchronously or synchronously.

For asynchronous communication, the start and stop bits previously defined are used to frame each character. These bits ensure that the transmitter and receiver function harmoniously—that each character is recognized by the receiver, in turn, as it is transmitted. Any length of time can occur between each character, as normally occurs when an individual enters data at a terminal keyboard.

For synchronous communication, a group of characters or block of data is sent as a continuous steam of bits. The communicating modems use a timing signal that establishes the data transmission rate. Special synchronization characters are sent prior to beginning data transmission so that the transmitter and receiver may synchronize with each other. Since data must be sent as blocks of characters, output is stored in a buffer until the appropriate number of characters has been collected for transmission.

Transmission Characteristics+

ASYNCHRONOUS vs.	SYNCHRONOUS
Each character is framed by one start bit and one or more stop bits.	Each block of characters is preceded by a sync character.
Bits within a character are transmitted at prescribed time intervals.	Synchronization is maintained by sync characters transmitted between blocks.
Idle time may occur between characters transmitted.	No time gaps occur between characters.
Data is transmitted as it is generated.	Data is held in a buffer until a complete block has been generated for transmission.

†Based on Gilbert Held, *Data Communication Components: Characteristics, Operation. Applications* (Rochelle Park, NJ: Hayden Book Co., 1979), p.14.

The Micromodem IIe communicates asynchronously with the IBM Personal Computers.

Transmission Speed

Transmission speed of a modem is measured as a **baud rate**. Baud is the modulation rate or the number of times the carrier signal is modulated per second. At the standard low speed transmission rates (110 and 300) the baud rate is equal to the number of bits transmitted per second, since the carrier signal is modulated once for each data bit. At higher transmission speeds, two or more data bits may be encoded on each baud.

Transmission speed is determined by the speed of the remote system with which a modem will commnicate. A remote system may offer one telephone number for reaching its low speed data line and another for its high speed line. The speed of the local computer or terminal must be set identically to that of the remote system. It is set by changing a switch in a computer or terminal or by executing a software command. Smartcom II allows the transmission rate to be reset simply by changing a given parameter. The Smartmodem 300 operates at 0-300 bps: the Smartmodem 1200 operates at 0-300 bps and 1200 bps. The standard rates are 110, 300, and 1200 bps. Since one character is generally comprised of ten bits, this translates into a transmission rate of approximately 10, 30, and 120 characters per second.

A connection at any transmission rate is possible only between two modems capable of and set for the same rate. If a connection is attempted between incompatible equipment, unintelligible data appears on the screen.

Communication Channels

The communication channel that connects remote computers may be classified by the direction and manner in which it moves data.

A **simplex** connection carries data in one direction only. Television and radio use simplex communication.

Half-duplex conducts alternating two-way communication over a single channel. The CB radio is an example of half-duplex communication. which allows only one person to communicate at a time. In half-duplex data communication systems, a terminal must wait for a computer at the other end of a line to stop sending data before it may transmit data; data cannot be simultaneously transmitted and received.

Full-duplex allows simultaneous two-way communication via two communications channels, one going in each direction. A telephone conversation is an example of two-way communication between two persons at the same time.

The Smartmodems always use two communication channels to send and receive data simultaneously. The terminology "half-duplex" and "full-duplex" is used, however, to differentiate between characteristics of half- and full-duplex transmission other than the type of communication channel.

Echo-plex is a method of echoing characters for screen display. A character typed travels to a distant computer and is echoed by it for display on the originating terminal's screen. Echo-plex allows the quality of the communication line to be monitored. If a character is distorted in transit, an incorrect character may be displayed on the screen. If a character is lost in transmission, it does not appear at all. Because echo-plex is a feature of full-duplex but not half-duplex communication, full-duplex and half-duplex have become synonymous with echo-plex and no echo-plex. When echo-plex is *not* in effect, characters must be displayed by the terminal or computer system at the time they are sent to the modem.

Both the local and remote computers must be set either to perform or not to perform with echo-plex. If characters are echoed for display by *both* the local and remote systems, they appear twice on the screen. If they are not echoed by either system, they do not appear at all.

When Smartcom II is running, it controls the display of characters. The kind of echoing performed is also dependent on where a call originates.

In half-duplex (no echo-plex), whether you originate or answer a call, outgoing keyboard or disk characters are displayed locally and incoming characters are not echoed for remote display.

In full-duplex (echo-plex), the originator neither displays nor echoes characters. The answerer, however, locally displays outgoing characters and echoes incoming characters for remote display.

Modem Compatibility

Similar to the EIA standard that specifies signaling between a modem and the local computer or terminal, standards exist for the frequencies of the signals transmitted over the telephone lines. These standards are based on several series of widely used modems developed by Bell Telephone Laboratories. Two of the most common are designated Bell 103 and 212A type modems. In addition to frequency selection, characteristics such as the modulation technique and transmission speed are also specified.

The Smartmodem 300 is compatible with Bell 103 type modems: the Smartmodem 1200 is compatible with Bell 212A type modems, which include Bell 103 type modem features. However, the Bell 212A modem may be set to communicate with the local computer either synchronously or asynchronously. The Smartmodem 1200 communicates asynchronously only. It cannot communicate with a Bell 212A modem set for synchronous communication since the character format of synchronous data differs from that of asynchronous.

All of the Smartmodem characteristics described in this chapter and the features of the Bell standard, are summarized in the following table.

Modem Characteristics

Smartmodem 300 & Smartmodem 1200

- Connect directly to the telephone line
- Provide features of full- and half-duplex communication
- Originate & answer telephone calls
- Perform serial asynchronous transmission+

Bell 103 Standard-Features

Smartmodem 1200 Smartmodem 300

Bell 212 -Standard Features

- Transmits 0-300 bps Transmits 1200 bps
- Uses Frequency Shift Keying (FSK)

Modulation

 Uses Phase Shift Keying (PSK) Modulation

 Includes all Bell 103 standard features

- cies: 1070-1270 Hz & 2025-2225 Hz
- Operates at frequen- Operates at frequencies: 1200 & 2400 Hz

+The Smartmodem 1200 is compatible with Bell 212A type modems for asynchronous communication only.

Modem design criteria include the kind(s) of computers or terminals for which the modem is intended, the other modems with which it is to be compatible, the nature of the telephone lines, the technical standards in effect, and the speed(s) at which it will operate.

Some communication techniques are not variable by the user. Other parameters may be adjusted to accommodate various computer, terminal, printer, and modem characteristics, error checking techniques, and user preferences and desired applications. Smartcom II provides easy access to the variable parameters. The program controls timing parameters related to establishing a connection; it allows duplex, data rate, and data format to be selected. It transmits data to both parallel and serial printers and permits a data rate for transmission to the printer to be selected independent from the telephone transmission rate.

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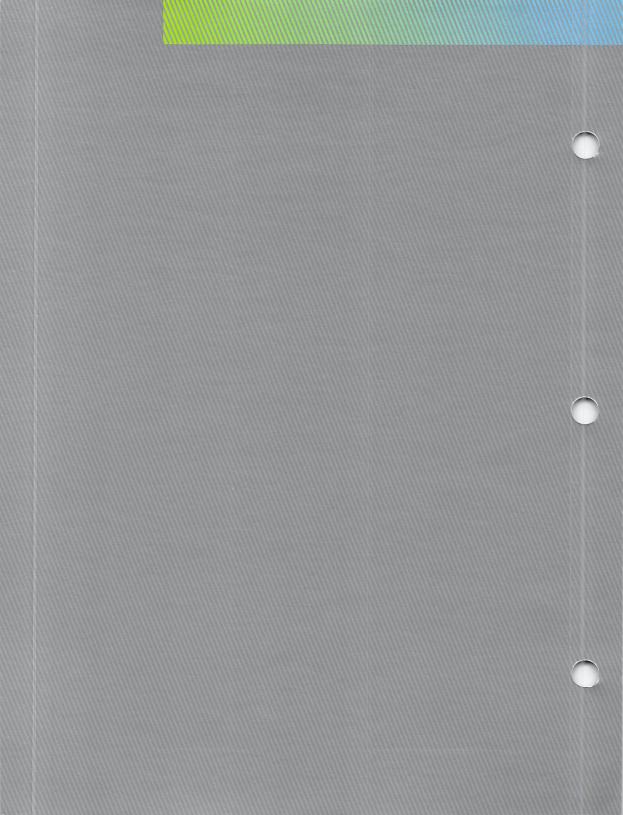
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Networks and Information Services

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CompuServe® Information Service9-2
Dow Jones News/Retrieval®
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Networks and Services

Notice: Although Hayes has attempted to verify the accuracy of the following information concerning national information and electronic mail services. Hayes does not warrant and assumes no responsibility for the accuracy of such information. This information is included in the Owner's Manual to demonstrate the ability of Smartcom II to communicate with such systems and to provide valuable information to purchasers of Smartcom II. These information services may, however, make changes in their internal systems which would result in the temporary inability of a user of Smartcom II to access the service using the examples set forth in the Owner's Manual. Example parameter values included in Smartcom II may be modified to accommodate any changes by the services.

Smartcom II helps you to communicate with national information and electronic mail services. An information service is contacted by first accessing a nationwide communication network. (Procedures for obtaining local network telephone numbers are included at the end of this chapter.) Five such networks in the United States are CompuServe Network Services, Telenet, Tymnet, UNINET, and Sourcenet. One such network in Canada is Datapac. These networks, also known as gateways, are referred to throughout this manual.

In addition to the services described in this chapter, microcomputer owners can use Smartcom II to participate in electronic message systems, such as public access databases or bulletin boards, that allow users to post notes or advertisements, maintain "post office boxes," and perform other activities for business purposes or entertainment. Bulletin boards are widely available throughout the United States. A list of public access databases, or bulletin boards, is available through Hayes. Call (404) 441-1617 between 8:00 a.m. and 8:00 p.m. EST to receive a copy.

CompuServe® Information Service

CompuServe Information Service offers a variety of features including:

- News retrieval from newspapers and newswires.
- Current and historical financial information, corporate profiles, and electronic banking.
- Entertainment—theater, book, movie, and restaurant reviews, interactive electronic games, advice columns, and trivia tests.
- Electronic mail service for sending messages to other CompuServe users nationwide.
- Home information—a variety of specialized publications, plus facts on nutrition, gardening, home decorating, and education, including an electronic encyclopedia and electronic shopping.
- Personal computing services including software exchange, programming languages, word processing, and business programs.

CompuServe's computers are located in Columbus. Ohio.

Service Hours:

Standard Service: Week nights 6 p.m. to 5 a.m., Saturday, Sunday, Announced Holidays.

Prime Service: Weekdays 8 a.m. to 6 p.m.

Network Access:

CompuServe Network Services, Telenet, Tymnet, Datapac.

User Assistance:

Available while on-line with CompuServe's Feedback service. Customer Service available at 1-800-848-8990; in Ohio, 614-457-8650.

Documentation:

Available through the Feedback service. Your billing information must be approved before documentation can be ordered.

Procedure for Obtaining an Account:

- 1. Contact your local computer retailer.
- 2. You will receive instructions for obtaining your personal CompuServe User Identification Number and Password.

Using Smartcom II with CompuServe

The CompuServe Information Service may be accessed through CompuServe Network Services, Telenet, Tymnet, or Datapac communication networks. The Smartcom II program disk contains twenty-six Macros already defined for use with CompuServe.

The Stop/Start Protocol is used to communicate with CompuServe. CTRL-S is the recognized **Stop Character** and CTRL-Q the **Start Character**.

Before connection is made, the **Phone Number** and **Baud** must be entered on the appropriate Parameters screen. In addition, the User ID and Password must be entered in Macro **Z**, the **Automatic Log-on Macro**. See Chapter 3, under the heading "Introduction to begin Communication," for typical procedure.

Communication Sets:

- A-CompuServe
- B-CompuServe Telenet
- C—CompuServe Tymnet
- **S** –CompuServe Datapac

User ID# and Password Structure:

The User ID number is in two parts, separated by a comma. Go to Macro Z and press **Return** until you reach the Macro data line containing **77770,111**. Type **CTRL-X** to delete the number, then enter your User ID number in its place.

A separate password is used. Press **Return** until you reach the Macro \overline{Z} data line containing **FREE-DEMO**. Type **CTRL-X** to delete the entry, then enter your password in its place.

Predefined Macros:

A set of 26 predefined Macros, including **Automatic Log-on Macro Z**, is provided for accessing CompuServe Information Service through any of the communication networks listed above.

Dow Jones News/Retrieval®

Dow Jones News/Retrieval brings you up-to-the-minute news and information, providing a convenient and productive tool in daily business decisions. It is for anyone with an interest in the news and the economy, whether it be for managing information for business or following the stock market for personal investments. News/Retrieval offers over 26 data bases including:

- Business and Economic News: up-to-the minute stories, accessed by company or industry, from *The Wall Street Journal, Barron's*, and the Dow Jones News Service, going back to June 1979; Wall Street Journal Highlights Online; Weekly Economic Update; Dow Jones Text-Search Services.
- Dow Jones Quotes: featuring current and historical quotes and historical Dow Jones Averages.
- Financial and Investment Services: Corporate Earnings Estimator; Disclosure II featuring company profiles and 10K extracts; detailed corporate financial information from Media General Inc.: Weekly Economic Survey from Money Market Services; Forbes Directory; Japan Economic Daily; Official Airline Guide; Merrill Lynch Research Service.
- General News and Information: on-line encyclopedia updated twice yearly: World Report with constantly updated national and foreign news; Sports and Weather Report; Wall \$treet Week transcripts; Movie Reviews; an electronic shopping service; News Retrieval Symbol Directory; Words of Wall Street offering definitions of over 2,000 business and financial terms.

Operating Hours:

6 a.m. to 4 a.m. (Eastern time) Monday–Friday, Weekends and Holidays

Network Access:

Telenet, Tymnet, UNINET, Datapac

User Assistance:

Customer Service Hotline: 8 a.m. to 12 midnight (Eastern time) Monday–Friday: 9 a.m. to 6 p.m. (Eastern time) Saturday

800-257-5114 (Toll-Free) 609-452-1511 (in New Jersey, Hawaii, Alaska, and Canada)

Documentation:

The Dow Jones News/Retrieval Fact Finder explains log-on sequences, explains the contents of data bases, contains stock symbols, and provides Tymnet and Telenet telephone numbers. The Fact Finder is available from DJN/R.

Procedure for Obtaining an Account:

- Call Dow Jones Customer Service Hotline number listed above.
- 2. Tell the representative you have purchased the Hayes Smartcom II package, and give your Smartmodem serial number.
- 3. You will receive a password from the Dow Jones News/Retrieval representative.
- 4. You will receive an information kit in the mail on Dow Jones News/Retrieval, including a User Agreement.

Using Smartcom II with Dow Jones News/Retrieval

Dow Jones News/Retrieval may be accessed through Telenet. Tymnet, UNINET, or Datapac communication networks. The Smartcom II program disk contains twenty-six Macros already defined for use with DJN/R.

The Stop/Start Protocol is used to communicate with DJN/R. CTRL-S is the recognized **Stop Character** and CTRL-Q the **Start Character**.

Before connection is made, the **Phone Number** and **Baud** must be entered on the Parameters screen. In addition, the Password must be entered in Macro **Z**, the **Automatic Log-on Macro**. See Chapter 3, under the heading "Introduction to Begin Communication," for typical procedure.

Communication Sets:

D-DJN/R Telenet

E-DJN/R Tymnet

F-DJN/R UNINET

T-DJN/R Datapac

Password:

Dow Jones News/Retrieval requires only a password to make connection with the system. There are no special requirements for entering your password, except that it must be limited to one line.

Predefined Macros:

A set of 26 predefined Macros, including **Automatic Log-on Macro Z**, is provided for accessing DJN/R through any of the communication networks listed above.

Knowledge Index[™]

KNOWLEDGE INDEX is a powerful, low-cost information retrieval service which gives you evening and weekend access to a specially selected group of data bases. These data bases index and abstract over four million articles, books, conference papers, technical reports, and government documents. Virtually every subject is covered, from accounting to Zen.

KNOWLEDGE INDEX can help you: 1) find reviews of restaurants, movies, books, and consumer products, 2) keep up with the latest developments in your field, whether it is medicine or microelectronics, 3) introduce children to computer-based research techniques, and 4) produce bibliographies on just about any topic, in a matter of minutes.

KNOWLEDGE INDEX is a service of DIALOG® Information Services, Inc. (a subsidiary of Lockheed Corporation), the creators of the world's largest information retrieval system, currently used daily by thousands of corporations, universities, and libraries all over the world.

KNOWLEDGE INDEX data bases fall into several major categories:

- Business-Interim consolidated earnings, mergers, acquisitions, management changes, and other timely information about more than 9,000 publicly-held corporations is provided by STANDARD & POOR'S NEWS. Articles from over 500 journals such as *Business Week, Forbes, Harvard Business Review*, and *Journal of Marketing* are abstracted and indexed by ABI/INFORM.
- Technology—The INSPEC and ENGINEERING LITERATURE INDEX data bases provide access to worldwide literature on computers, electronics, physics, and engineering, covering over 5,000 journals.
- Medicine/Psychology—The MEDLINE data base, produced by the National Library of Medicine, covers current, worldwide developments in all phases of medicine, nursing, and health care administration. PSYCINFO includes over 300,000 citations on psychology and mental health.

- Current Affairs—Daily cover-to-cover indexing is provided for the New York Times, The Wall Street Journal, Christian Science Monitor, Washington Post, and Los Angeles Times by the NEWSEARCH data base.
- Education—The ERIC data base covers the literature of education, going back over fifteen years. Topics include reading, special education, computer-assisted instruction, educational administration, and more.
- General Interest—More than 350 popular journals such as Time, Consumer Reports, Byte, and Money are indexed in MAGAZINE INDEX. Over 25,000 government publications on topics including agriculture, energy, housing, education, and nutrition are included in the GPO PUBLICATIONS reference data base.

Operating Hours:

Monday through Thursday 6:00 p.m. to 5:00 a.m.; Friday 6:00 p.m. until midnight; Saturday 8:00 a.m. until midnight; Sunday 3:00 p.m. until 5:00 a.m. Monday

Network Access:

Telenet, Tymnet, Datapac

User Assistance:

Customer assistance provided toll-free to those outside of California: the number is provided to all KNOWLEDGE INDEX customers.

Documentation:

The documentation for KNOWLEDGE INDEX is a completely self-instructional user manual, one copy of which is included within the initiation fee for new KNOWLEDGE INDEX users. Additional copies are available at the thencurrent rate.

Procedure for Obtaining an Account:

1. Call toll-free to get a detailed description of services, a subject guide to data bases, and a contract.

800-528-6050, Ext. 415 800-352-0458, Ext. 415 (in Arizona) 800-528-0470, Ext. 415 (in Alaska and Hawaii)

or write to:

KNOWLEDGE INDEX
DIALOG Information Services, Inc.
3460 Hillview Avenue
Palo Alto, CA 94304

- 2. Sign and return the application for service, included in the information package.
- 3. KNOWLEDGE INDEX will then send a password, user manual, and list of telephone access numbers. You may then begin your searching adventures!

Using Smartcom II with KNOWLEDGE INDEX

KNOWLEDGE INDEX may be accessed through Telenet, Tymnet, or Datapac communication networks. The Smartcom II program disk contains twenty-six Macros already defined for use with KNOWLEDGE INDEX.

Smartcom II uses the Stop/Start Protocol to communicate with KNOWLEDGE INDEX. CTRL-S is recognized as the Stop Character and CTRL-Q as the Start Character.

Before connection is made, the **Phone Number** and **Baud** must be entered on the Parameters screen. In addition, the Account Number and Password must be entered in Macro **Z**, the **Automatic Log-on Macro**. See Chapter 3, under the heading "Introduction to Begin Communication," for typical procedure.

Communication Sets:

G-KNOWLEDGE INDEX Tel H-KNOWLEDGE INDEX Tym U-KNOWLEDGE INDEX Datapac

Account and Password Structure:

You are assigned an account number and a one word password. There are no special requirements for entering the password.

Predefined Macros:

A set of 26 predefined Macros, including **Automatic Log-on Macro Z**, is provided for accessing KNOWLEDGE INDEX through any of the communication networks listed above.

MCI Mail[™]

Send letters, reports, invoices, proposals, spreadsheet output files—almost any business communication—directly from your personal computer. Reach ANYONE, ANYWHERE in the continental U.S. with laser-printed correspondence that displays your registered letterhead and signature.

Your letter is sent to either your recipient's electronic mailbox or to an MCI Mail postal center for mail or courier delivery.

- The Overnight Letter: MCI Mail will hand-deliver your correspondence by noon of the next day.*
- The Four-Hour Letter: Within four hours, MCI Mail will hand-deliver your correspondence in major cities.* This means you can send a contract at 3:00 p.m. from New York and it will be on your addressee's desk in San Francisco by 4:00 p.m. local time.
- The MCI Letter: For less critical correspondence, select this economical delivery via U.S. Mail. MCI Mail speeds up the long-distance part of mail handling, generally enabling next-day delivery in most areas of the U.S.
- The Instant Letter: When "now" is almost too late, send your messages instantly to other MCI Mail customers in an electronic form that is made compatible with their particular device. They can read the message at their convenience from their electronic mailbox.
- Telex Dispatch: Reach any telex address in the world through MCI Mail's Telex Dispatch. Send and receive domestic and international messages from wherever you happen to be.

Operating Hours:

24 hours a day, 7 days a week, including holidays.*

Network Access:

MCI Mail's private network. Local access available in major metropolitan areas; toll-free 800 access available nationwide.

User Assistance:

Three ways to receive user assistance:

- 1. Call toll-free 800-424-6677; in Washington, D.C., 833-8484. Available seven days a week during normal business hours.
- 2. CREATE a toll-free message to MCIHELP.
- 3. Type **HELP** while on-line.

Documentation:

The MCI Mail Starter Kit includes a user's guide, service description, access numbers, log-on procedures, and signature/letterhead registration form. Provided upon registration.

Procedure for Obtaining an Account:

Two ways to register FREE:

1. Register via your personal computer by loading Smartcom II and selecting MCI Mail from the communication directory. You will be connected to MCI Mail registration; follow the online instructions.

or

2. Call MCI Mail at 800-MCI-2255; in Washington D.C., 833-8484.

*For Overnight and Four-hour options, see MCI Mail and online HELP guide for areas served, delivery times, and limitations on liabilities. Create, send, and receive Instant letters anytime. 24 hours a day.

MCI Mail is a Service Mark of MCI Communications Corporation.

Using Smartcom II with MCI Mail

MCI Mail is accessed through MCI Mail's private network. The Smartcom II program disk contains seven Macros already defined for use with MCI Mail.

Smartcom II uses the Stop/Start Protocol to communicate with MCI Mail. CTRL-S is recognized as the Stop Character and CTRL-O as the Start Character.

Before connection is made, the **Phone Number** and **Baud** must be entered on the Parameters screen. Likewise, the Username and Password must be entered in Macro Z, the Automatic Logon Macro. See Chapter 3, under the heading "Introduction to Begin Communication," for typical procedure.

Communication Set:

I-MCI Mail

Username and Password

Your MCI Mail Starter Kit will contain your assigned Username and Password. Enter your Username and Password into the Automatic Log-on Macro Z.

- From the Main Menu, select 2. Edit Set
- Press **S(et**
- Enter I for MCI Mail
- Press M(acros
- Press **Z** for Automatic Log-on.
- Press **Return** until the cursor rests at the right of the first occurrence of REGISTER. Press Ctrl-X, and enter your assigned Username.
- Press **Return** four more times so the cursor rests to the right of the second occurrence of **REGISTER**. Press **Ctrl-X** and type in your Password.
- Press the Escape key: press R at the prompt R(ecord, I(gnore, E(rase?

Access Number:

Your MCI Mail Starter Kit also includes a list of local access numbers. Select the number in your area, and use it to replace the registration-only number on the Parameters Screen:

- From the Main Menu, select 2. Edit Set
- Press S(et
- Press I for MCI Mail
- Press P(arameters
- Press the up arrow (↑) twice; the cursor is now positioned at the line for Phone Number
- Press Ctrl-X, and type in your MCI Mail telephone number. Press Return.
- Press Y to Record to Disk.

Predefined Macros:

In addition to Macro Z, Automatic Log-on, six predefined Macros for MCI Mail are included in Communication Set I.

Official Airline Guide-Electronic Edition (OAG EE)

The Official Airline Guide-Electronic Edition (OAG EE) is the most comprehensive, unbiased, single source for worldwide airline schedules and detailed North American fare information, including fare limitations. With the OAG EE you can decide the best fares and flights for your particular travel requirements. If your travel plans include North American points, the OAG EE enables you to find the lowest fare in the market. Then, at your command, it will select flights which offer that fare. Should exact departure or arrival information be critical in planning your itinerary, the OAG EE offers you an entire range of flight times from which to choose the ones most fitting your requirements. You can then use the OAG EE to determine the lowest fares offered on the flights you have selected. The OAG EE furnishes all the itinerary information you need to call your travel agent or airline to secure a reservation and your tickets.

The OAG EE provides:

- Daily fare updates
- Weekly flight schedule updates
- North American fares listed from lowest to highest
- Fare limitation rules presented in easily understandable terms
- Worldwide direct flight schedules and connections
- Easy to use instructions and prompts requiring no programming experience by the user
- Easy accessibility through Telenet, Tymnet, UNINET, and Datapac public access networks

Operating Hours:

Service 24 hours a day: 365-day-a-year availability with possible short down time between the hours of 2:00 a.m. and 5:00 a.m. Central time for system maintenance.

Network Access:

Telenet, Tymnet, UNINET, Datapac

User Assistance:

A toll-free telephone number is available to all subscribers. open 24-hours a day to assist subscribers using the OAG EE. 800-323-4000 800-942-3011 (Illinois)

Documentation:

A user's manual and other subscriber support material is sent to each new subscriber, as well as a Subscriber I D and Password.

Procedure for Obtaining and Account:

You may order a subscription to the Official Airline Guide-Electronic Edition by calling the following toll-free numbers Monday through Friday, between 7:00 a.m. and 10:00 p.m. Central time.

800-323-3537 Ext. 7954

800-942-1888 Ext. 7954 (Illinois)

Using Smartcom II with Official Airline Guide-Electronic Edition The Official Airline Guide-Electronic Edition may be accessed through Telenet. Tymnet. UNINET, or Datapac communication networks. The Smartcom II program disk contains twenty-six Macros already defined for us with OAG EE.

Smartcom II uses the Stop/Start Protocol to communicate with OAG EE. CTRL-S is recognized as the **Stop Character** and CTRL-Q as the **Start Character**.

Before connection is made, the **Phone Number** and **Baud** must be entered on the Parameters screen. In addition, the Subscriber I D and Password must be entered in Macro **Z**, the **Automatic Log-on Macro**. See Chapter 3, under the heading "Introduction to Begin Communication." for typical procedure.

Communication Sets:

I – OAG EE Telenet

K-OAG EE Tymnet

L-OAG EE UNINET

V-OAG EE Datapac

I.D. and Password:

OAG EE requires both a Subscriber I D number and a password to make connection with the system. There are no special requirements for entering your I D number and password.

Predefined Macros:

A set of 26 predefined Macros, including **Automatic Log-on Macro Z**, is provided for accessing OAG EE through any of the communication networks listed above.

THE SOURCE, AMERICA'S INFORMATION UTILITY SM

THE SOURCE, AMERICA'S INFORMATION UTILITY offers both communication and information services. Through THE SOURCE you may meet people, exchange ideas, obtain important information, and carry out transactions. Whatever your profession or interests, there is something for you among the services on THE SOURCE, including:

- UPI News Service with key word search capability
- Sourcemail system to send/receive messages to/from other members
- Classified ad bulletin boards with more than seventy-five categories
- Stocks, bonds, money market and mutual funds trading activity on the New York, American, and OTC exchanges
- Electronic travel service, airline schedules, movie reviews and employment service
- Electronic shopping, games, and newsletters

Operating Hours:

Service twenty-two hours a day.

Network Access:

Sourcenet, Telenet, UNINET, Datapac

User Assistance:

Customer Support Day and Night

1-800-336-3330 1-703-734-7540 (Virginia) Via Sourcemail at TCA088

Documentation:

THE SOURCE Manual describes how to use the communication and information services provided by THE SOURCE, including complete sign-on instructions; billing information; plus details of advanced features such as transferring files, text editing, and uploading. Fully indexed.

THE SOURCE Command Guide provides all of the direct commands for services on THE SOURCE.

SOURCEWORLD Newsletter and regular service profiles provide ongoing documentation and information for members of THE SOURCE.

Procedure for Obtaining an Account:

- 1. Have a pen and credit card handy (Visa, Mastercard, or American Express) and note the serial number of your Hayes Smartmodem.
- 2. Call the Communications Marketing Department at the tollfree number - 800-336-3366 (in Virginia 703-821-6666). Call any time weekdays 8:30 a.m.-9:00 p.m., EST. Your I D and Password will be assigned to you when you inform the operator of the following claim number: 2825022.*
- 3. Following your call, you will receive a New Member Kit, which includes a partially completed Membership Agreement. Within ten days, you must complete and return your Membership Agreement to THE SOURCE. THE SOURCE Manual may be purchased for \$19.95 or the then-current retail price charged by THE SOURCE.

*Members of THE SOURCE pay for the time used on THE SOURCE and for any information stored on it, subject to a small monthly minimum (see Rates and Fees). All individual members of THE SOURCE must pay for usage by major credit card.

Using Smartcom II with THE SOURCEsm

THE SOURCE may be accessed through Sourcenet, Telenet. UNINET, or Datapac communication networks. The Smartcom II program disk contains twenty-six Macros already defined for use with THE SOURCE.

THE SOURCE and Smartcom II communicate using the Stop/Start Protocol. CTRL-S is recognized as the **Stop Character** and CTRL-Q as the **Start Character**.

Before connection is made, the **Phone Number** and **Baud** must be entered on the Parameters screen. In addition, the account number (ID) and Password must be entered in Macro **Z**, the **Automatic Log-on Macro**. See Chapter 3, under the heading "Introduction to Begin Communication," for typical procedure.

Macros may be activated at the appearance of a system prompt. (\longrightarrow) . When the system is processing information, enter QUIT or STOP to generate the system prompt.

Communication Sets

M—THE SOURCE Sourcenet N—THE SOURCE Telenet O—THE SOURCE UNINET W—THE SOURCE Datapac

Account and Password Structure

The I D typically consists of three characters and three numbers. Enter your I D number into the **Automatic Log-on** Macro **Z**; include "I D" as the first two characters, followed by a space, before typing the I D number. (See Chapter 3, under the heading "Introduction to Begin Communication" for the typical procedure.)

Example: ID TCE218 (valid) TCE218 (invalid) IDTCE218 (invalid)

The password is entered on the next Macro Data line.

Predefined Macros

A set of 26 predefined Macros, including **Automatic Log-on Macro Z**, is provided for accessing THE SOURCE through any of the communication networks listed above.

Networks

The following pages present telephone numbers used to contact CompuServe Network Services, Datapac, SOURCENET, Telenet, Tymnet, and Uninet networks; space is provided for entering these services' local access numbers when obtained. You may also wish to contact your local computer dealer for the telephone numbers of other networks by which national information services can be contacted. Forms for recording information on your own accounts are provided at the end of this chapter.

CompuServe Network Services

CompuServe Network Services are available in many locations throughout the United States. To obtain the local dial-in telephone number nearest you, ask your computer dealer or contact CompuServe Network Services at:

800-848-8990

City	Number	Baud
	*	

Datapac

Datapac is available in many locations throughout Canada. To obtain the local dial-in telephone number nearest you, ask your computer dealer or contact Datapac at:

Montreal: 514-394-0144 Ottawa: 613-567-2491 Toronto: 416-581-2000

City	Number	Baud
	_	
	_	
·		

Sourcenet

Sourcenet is available in many locations throughout the United States. To obtain the local dial-in telephone number nearest you, ask your computer dealer or contact THE SOURCE at:

800-336-3366 800-572-2070 (Virginia only).

City	Number	Baud

Telenet

GTE Telenet Communications Corporation is a part of General Telephone & Electronics. Dial-in access to Telenet is available in the United States through local network facilities. To obtain the dial-in number for the facility nearest you, ask your computer dealer or contact Telenet at:

800-336-0437 800-572-0408 (Virginia only).

City	Number	Baud

Tymnet

Tymnet, Inc. has dial-in access in hundreds of locations throughout the United States. To obtain the local dial-in number nearest you, ask your computer dealer or contact Tymnet at:

800-336-0149

City	Number	Baud

Uninet

Uninet is available in many locations throughout the United States. To obtain the local dial-in number nearest you, ask your computer dealer or contact Uninet at:

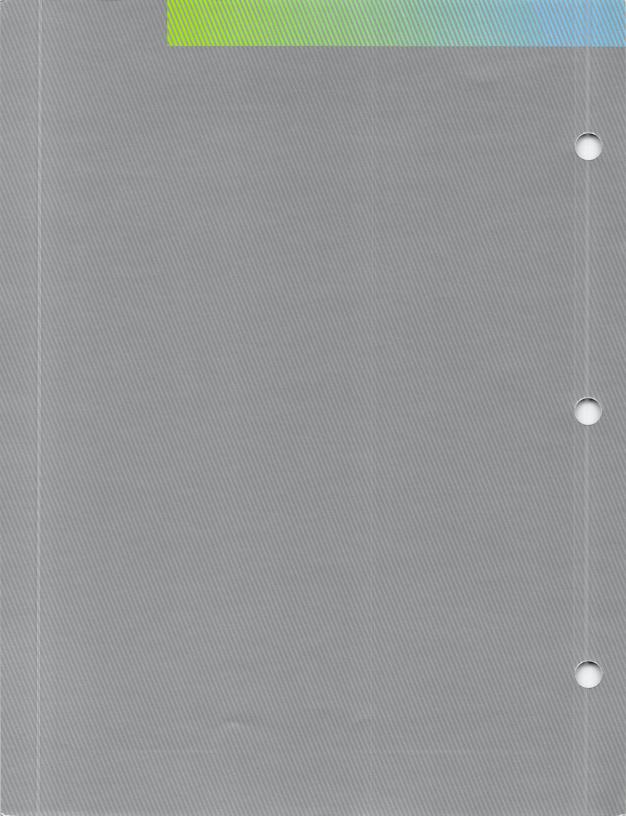
800-821-5340

City	Number	Baud

Account Notes

Name	Telephone Number	Account Number	Service
		9	





Glossary

Acoustic modem

A modem featuring special cups into which a telephone handset is placed (compare **Direct-connection modem**).

Answer on Ring parameter

An option allowing you to specify the number of ringing signals that must occur before the Smartmodem automatically answers a call.

ASCII

American Standard Code for Information Interchange: a standard character set and coding scheme in which a seven-bit code represents numbers, symbols, and special control codes.

Asynchronous communication

A way of transmitting data in which start and stop bits are used to frame each character, ensuring that each character is recognized by the receiver as it is transmitted (compare **Synchronous communication**).

Asynchronous communication adapter

A device used in installing a serial printer to a microcomputer.

Automatic Log-on

Macro Z for each communication set provided with your Smart-com II diskette. This macro automatically performs the log-on sequence for the remote system you are contacting. You may also create and store your own automatic log-on Macros for use with other remote systems.

Available Disk Drives A value on the Configuration screen that identifies the disk drives connected to your computer.

Batch Commands Series of commands recorded for immediate or delayed playback, executable by a single command.

Baud rate

The speed at which data is transmitted from a modem: Smartcom II offers two baud rates, 300 bps (bits per second) and 1200 bps. Break key

A function that interrupts processing during communications with a time-sharing system. Identified on the lower status line.

Break Length

A parameter that determines the duration of the signal generated by the Break key. To interrupt the remote computer, the break signal must be long enough to gain its attention. This parameter allows you to select the appropriate duration.

Buffer

See Data buffer and Display buffer.

Buffer recall keys Special keys on the computer keyboard, assigned by Smartcom II the function of controlling the display of data recalled from buffers

Bulletin Board An electronic message system that allows users to post notes or advertisements and to maintain "post office boxes" for receiving and storing electronic mail.

Byte

In computer processing, an eight-bit numerical equivalent of a character; for example, the byte 01000001 represents the letter A.

Capture key

Used to control information stored on disk while receiving text files via Stop/Start protocol. The Capture key is identified on the lower status line following the word "Disk." If pressed during a Receive File operation, the Capture key causes the program to suspend incoming data; if pressed while on-line in a conversation mode, the Capture key causes the storing of data to begin. In either case, pressing the Capture key again causes the action to be reversed.

Carrier Loss to Hang Up Time The value that determines the length of time between the loss of a carrier signal and Smartmodem's "hanging up." Useful in keeping the Smartmodem from disconnecting due to momentary loss of carrier signal.

Carrier signals

Signals exchanged by modems over telephone lines: continuous, audible tones at predetermined frequencies.

Character Delay parameter

The parameter that allows you to set a time lapse between transmitted characters.

Character Processing

The parameter that determines whether Smartcom II filters incoming data for control characters; FORMATTED Character Processing causes the control characters to be filtered, and DIRECT Character Processing causes Smartcom II not to examine incoming data for control characters.

Communication Set A set of values (telephone number, parameters, macros, log-on sequence, etc.) that defines the way your computer communicates with a remote system. Smartcom II includes a number of predefined communication sets: their names are displayed on the Communication Set Directory.

Communication Set The Parameters and Macros defined for use with a remote computer.

Communication Set Directory Displayed when you choose to Begin Communications at the Master Menu. Lists the names of the remote systems you may call, preceded by the letter you are to enter to choose a communication set.

Communication software

A computer program, such as Smartcom II, that enables a computer to interface with a modem.

Communications
Port value

A value on the Configuration screen that identifies the communication port designated for the Smartmodem.

Compressed data file

A file with data moved so that all available space is contiguous, thus reducing the file size and saving disk space.

Compressed Printing Useful for printing spreadsheets and other output more than eighty columns wide; compressed printing can be used on many dot-matrix printers to decrease the width (not height) of each character so that more characters fit on each line.

Confidential parameter

An option used during a file transfer to keep outgoing information from being displayed; does not inhibit the display of the menu or status lines.

Configuration

The hardware and software which make up your computer system. Also refer to System Configuration. Smartcom II has a Configuration Screen which must reflect your system's configuration.

Control code

A non-graphic character which controls an operation such as Return, clear screen, and backspace.

Conversation mode

An operating mode in which communication with a remote system is ongoing but files are not being sent or received. Smartcom II can return to **Local mode** from conversation mode without disconnecting from the remote system (compare **Transfer mode**).

Data buffer

Space allocated in memory by Smartcom II for temporary storage of incoming data as it is routed to the screen, disk drives, or the printer; aids in the prevention of s.

DC1/DC3 protocol Stop/Start data communications protocol in which CTRL-S (DC3) is the **Stop Character** and CTRL-Q (DC1) is the **Start** Character.

Default

A standard value automatically used when no other value has been specified.

Default Set

A value on the Parameters screen that determines the communication Set to be in effect whenever Smartcom II is started up.

Demodulator

The part of a modem that converts analog signals for use by a computer (compare Modulator).

Dialing Method

A value on the Configuration screen that determines whether the Smartmodem uses pulse or Touch-Tone dialing, so that it may match the type of telephone line to which it is connected.

Direct-connection method

A modem that bypasses the telephone and connects directly to a telephone jack; results in a modem with lower sensitivity to noise than an acoustic modem.

Disk Directory

A list of files on the currently used diskette, displayed beneath the Main Menu; can be turned on or off by pressing 9 at the Main Menu.

Display adapter

A PC card installed in your computer for the purpose of interfacing a video monitor with your computer.

Display buffer

A portion of memory used by Smartcom II to store incoming data when on-line to a remote computer.

Duplex

See Half duplex and Full duplex, the two possible settings for Smartcom II: both Smartcom II and the remote system must have the same Duplex setting.

Echo-plex

A feature of **full-duplex communication channels** in which typed characters travel to a distant computer and are echoed by d on the originating terminal's screen, thus allowing the quality of the communication line to be monitored.

Emulation

A process that enables your computer to respond as if it were a different type of terminal. There are four types of emulation available with Smartcom II; TTY, Televideo Subset, VT52, and VT102/VT100, each set to receive a unique set of control codes.

End of line (EOL) character

Used with Send Lines protocol only, a character which signifies the end of a portion of text being sent. Normally set to Return or line feed. Error-Free protocol

A special file-transfer protocol in which all eight data bits of each character are transferred unchanged, and the detection of an error automatically causes the data block to be resent.

Escape key

The key used to redisplay the Main Menu when on-line with another computer or to stop sending a Macro. The Escape key is identified on the lower status line, following the word "Menu."

File

A collection of information, stored on disk, which may be accessed by entering the appropriate file name.

File Commands

The commands Create. Display. Print. Rename. and Erase. accessed through option 3 on the Smartcom II Main Menu. File Transfer protocols—See Protocol and Stop/Start, Send Lines. and Error-free protocols.

Full-duplex communication channel

Allows simultaneous two-way communication via two channels, one going in each direction, as with a Smartmodem (compare Half-duplex communication channel).

Half-duplex communication channel Conducts alternating two-way communication over a single channel. In a half-duplex data communication system, a terminal must wait for a computer at the other end of a line to stop sending data before it may begin transmission; data cannot be simultaneously transmitted and received (compare Full-duplex communication channel).

Help

On-line assistance during use of Smartcom II. Accessed by pressing the defined Help Key; the Help key is identified on the lower status line.

Include Line Feeds parameter Ensures that lines are correctly spaced when printed, regardless of the cursor-advance method used by the remote system sending the file.

Keyboard Definitions Parameters that allow you to define a key to be used to activate a particular function, such as Print.

Line Delay The parameter that allows you to set a time lapse following a Return and preceding the transmission of the next line. parameters Line Feed A character that causes the cursor to advance one line Local mode The operating mode of Smartcom II when it is not involved in communication with a remote system (compare On-line mode). Log-on message A message which you create and store for the purpose of sending to a caller when your computer answers a call. Limited to 40 printable ASCII characters. Lower status The **Status Line** appearing on line 24 of the screen during online line communication with Smartcom II; displays the Parameters screen settings of the Keyboard Definitions (Menu, Print, Disk, Macro, and Break). Macro Short for "macroinstruction," the Smartcom II facility that allows you to send a sequence of instructions to a remote system from disk. The instructions are processed by the remote system as if they had been entered from the keyboard. Macro Prefix Press to enter the letter A-Y that corresponds with a Macro you key wish to send to an on-line computer. Identified on the lower status line Main Menu The menu displayed when you first load up Smartcom II or when you press the Escape Key during operations; the menu from which program options are selected. Microcomputer A system of microcomputers interconnected by modems. Network Communication between microcomputers by use of modems. Micro-to-micro Communications Modem A Modulator-Demodulator device that enables computers to

Modulation The process of changing digital signals to analog signals.

communicate over telephone lines.

The part of the modem that converts digital signals to analog Modulator

signals for transmission across telephone lines (compare

Demodulator).

The video display device connected to your computer. Monitor

Name of Set parameter

transmission

The name assigned to a Communication Set created with Smartcom II: appears on the Communication Directory along

with the single letter (A-Z) that identifies the Set.

The operating mode of Smartcom II when involved in commu-On-line mode

nications with a remote system (compare Local mode).

A screen display transmitted and controlled by a remote sys-On-line screen

tem during communications.

See Local mode and On-line mode. Operating modes

An optional parameter that causes the display of incoming data Page Pause

> to pause after every twenty-two lines (twenty-four if Show Status Lines is OFF). Striking any key causes the next twenty-two

lines of information to be displayed.

A method of simultaneously transferring several bits of data **Parallel**

over multiple channels (compare Serial transmission).

Variables that determine the characteristics of a communication **Parameters**

> set. Parameters are divided into four main categories: Transmission, Keyboard Definition, Protocol, and Telephone

parameters.

Password A parameter the user may specify to limit access to a system

when unattended in Remote Access. Also, an identifier typed in

when logging on to a remote time-sharing device.

The value that sets the length of a pause triggered by a comma Pause Time

for Comma in a telephone number. Printer Baud Rate The value entered on the Configuration screen to identify the

baud rate of a serial printer (ignored when Printer Interface is

set to PARALLEL PORT).

Printer Interface The value entered on the Configuration screen to identify the

type of interface featured on your printer.

Printer key The key which, when pressed, tells Smartcom II to begin rout-

ing data to the printer.

Printer Interface The Printer Interface value that designates the printer type

protocol (parallel or serial) of your system.

Prompt Character

A character that, when received in **Send Lines protocol**, causes Smartcom II to begin sending data and checking each character

until the EOL Character is found

Protect key A function used to mask data entries in Macros; once an entry

has been masked, the characters ***PROTECTED***, rather than the characters that were entered, appear when the Macro

is displayed.

Protocol A process that helps two devices transfer data without error.

Protocol **Parameters**

User-selectable values which prescribe prompts, wait-times, and responses when transferring data. Refer to Send Time Out,

Receive Time Out, Error-Free Protocol, Stop/Start Character. Start Character, Send Lines-EOL Character, and Prompt Character for definitions of specific protocol parameters.

Read-only files Files which can be displayed or output but cannot be accessed for the purpose of alteration.

Receive Time-out parameter

Used with Stop/Start protocol to determine the amount of time

a file stays open and continues receiving data.

Recognize Carrier Signal

A value that determines the length of time a signal must be present for the Smartmodem to recognize it as a carrier.

Record to Disk

To make changes on a screen permanent, so that the screen will always appear with the changes until altered again.

Remote Access

An operating mode in which the originator of a call has control over an answering computer when files are transferred between the two computers.

Remote Computer A computer system with which your computer is communicating.

Scroll lock

The key that, when pressed, freezes the current display and holds it until the space bar is pressed. Refers also to the Smartcom II function wherein, if Page Pause is set to YES, the display is automatically frozen after twenty-two lines of text have been displayed, and remains frozen until a key is pressed.

Send Lines protocol

A protocol used when transmitting data to a remote system, as with some bulletin boards, that processes incoming data on a line-by-line basis.

Send Time-out parameter

A feature that keeps your computer from waiting for a character lost in transmission due to noise on the communication line. When used with Stop/Start protocol, this parameter sets a limit on the amount of time to elapse between the receipt of a **Stop** Character and a Start Character, or the time allowed to elapse without any character being sent. When used with Send Lines **Protocol**, this parameter controls the amount of time to elapse between transmitting the EOL Character and the first character of the next line, or to elapse without any character being sent.

Serial transmission

A method of transmitting data bit-by-bit so that only a single channel is needed to maintain communication (compare Parallel transmission).

Show Control Codes parameter The parameter that enables the display of control codes; useful when creating Macros.

Show Status Lines parameter

The parameter that determines whether status lines are to be displayed on the screen. Set to ON when you want to be informed of the program's status; set to OFF when you need all twenty-four lines of the screen for the display of output.

Speaker Status

The value that determines whether the Smartmodem speaker is always on, always off, or on only until a connection is made.

Start character

In **Stop/Start Protocol**, the character that re-initiates the transmission of characters after a Stop.

Stop character

In **Stop/Start Protocol**, the character that stops the transmission of characters.

Stop/Start protocol

A protocol that allows the recipient of a file to stop and start the transfer by transmitting a **Stop Character** and a **Start Character**.

Synchronous communication

A method of data transmission in which a group of characters is sent as a continuous stream of bits (compare **Asynchronous communication**).

System Configuration

Refers to Printer Interface, Printer Baud Rate, Available Disk Drives, etc.; the values for these items are stored on the Configuration screen.

Telephone Parameters Parameters which you set in each Communication Set to prescribe incoming and outgoing call conditions. Refer to Answer on Ring, Remote Access, Password, and Phone Number entries in Parameter screen.

Time-sharing

A method that allows several microcomputers to concurrently share the power and data storage capability of a large-scale computer for the purpose of retrieving files, running programs, and performing calculations.

Touch-Tone timing

The value that controls the speed (the duration and spacing of tones) of the Touch-Tone dialer.

Transfer mode

An operating mode in which communication with a remote system is ongoing and disk files are being transferred without

operator intervention.

Transmission **Parameters**

Parameters which determine the manner in which characters are formatted for the printer and disk file.

TTY

Teletype

Upper status line

The display of file status, printer status, and Smartmodem status on line 24 of the screen during use of Smartcom II.

Wait for Carrier Signal The value that determines the amount of time the Smartmodem waits for a carrier signal from a distant modem, after dialing or answering a call and before "hanging up."

Wait for Dial Tone

A value on the Parameters screen that determines the amount of time to elapse between the Smartmodem's "picking up the telephone line" and dialing the first digit of the number; set to allow time for the dial tone to be transmitted.

Wild card

An asterisk used to represent the bodies or extensions of file names for the purpose of transferring or erasing a group of files at once. For example, a set of backup files (all with the extension BAK) can be represented as * BAK.

X-MODEM protocol

An error-free file transfer protocol, used for communications between Hayes programs and X-MODEM-compatible programs such as PC-TALK or CROSSTALK.

The ASCII Character Chart

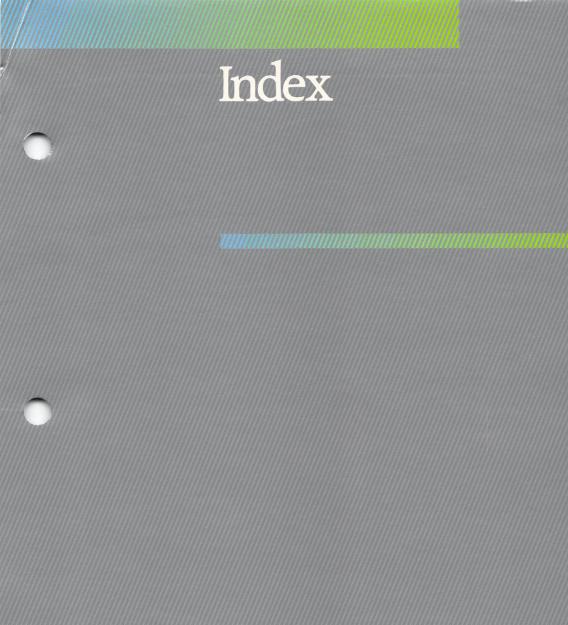
Decimal	Hex	ASCII	Keystrokes*
0	00	NUL	Ctrl @
1	01	SOH	Ctrl A
2	02	STX	Crtl B
3	03	ETX	Crtl C
4	04	EOT	Ctrl D
5	05	ENQ	Ctrl E
6	06	ACK	Ctrl F
7	07	BEL	Ctrl G
8	08	BS	Ctrl H Backspace Shift Backspace
9	09	HT	Ctrl I
10	0A	LF	Ctrl J, Ctrl
11	08	VT	Ctrl K
12	0C	FF	Ctrl L
13	0D	C	Ctrl M, Shift
14	0E	SO	Ctrl N
15	OF	SI	Ctrl O
16	10	DLE	Ctrl P
17	11	DC1	Ctrl Q
18	12	DC2	Ctrl R
19	13	DC3	Ctrl S
20	14	DC4	Ctrl T
21	15	NAK	Ctrl U
22	16	SYN	Ctrl V
23	17	ETB	Ctrl W
24	18	CAN	Ctrl X
25	19	EM	Ctrl Y
26	1A	SUB	Ctrl Z
27	1B	ESC	Ctrl [
			Esc, Shift, Esc, Ctrl Esc
28	1C	FS	Ctrl /
29	1D	GS	Ctrl]

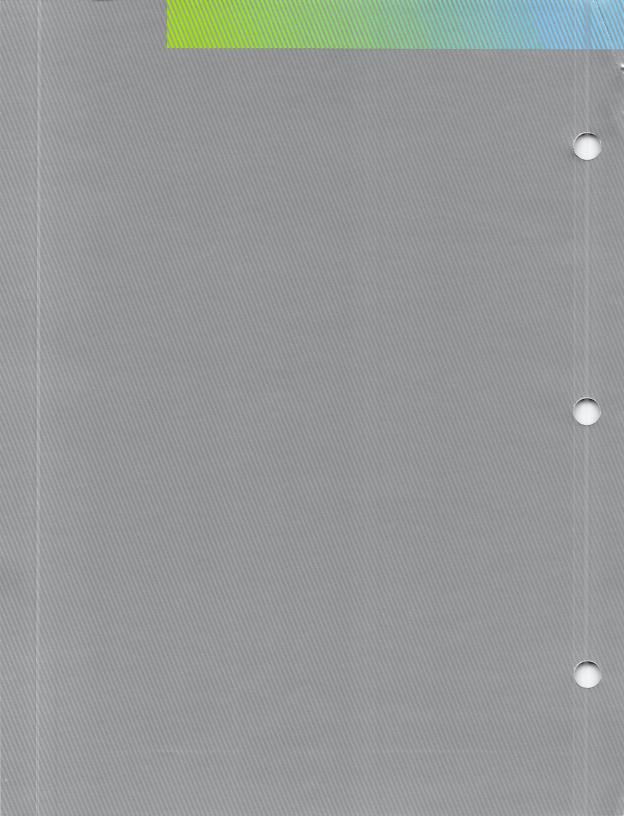
Decimal	Hex	ASCII	Keystrokes*
30	1E	RS	Ctrl ∧
31	1F	US	Crtl —
32	20	SP	Space Bar, Shift,
			Space, Ctrl
			Space, Alt Space
33	21	!	Ī
34	22	***	
35	23	#	#
36	24	\$	\$
37	25	%	%
38	26	&	&
39	27	15	2
40	28	((
41	29))
42	2A	*	*
43	2B	+	+
44	2C		,
45	2D	-	~
46	2E		
47	2F	1	1
48	30	0	0
49	31	1	1
50	32	2	2
51	33	3	3
52	34	4	4
53	35	5	5
54	36	6	6
55	37	7	7
56	38	8	8
57	39	9	9
58	3A	:	:
59	3B	;	;
60	3C	<	<

^{*} Applies only to Smartcom II

Decimal	Hex	ASCII	Keystrokes*
61	3D	=	=
62	3E	>	>
63	3F	?	?
64	40	@	@
65	41	Α	Α
66	42	В	В
67	43	C .	C
68	44	D	D
69	45	E	E
70	46	F	F
71	47	G	G
72	48	H	H
73	49	I	I
74	4A	J	J
75	4B	K	K
76	4C	L	L
77	4D	M	M
78	4E	N	N
79	4F	0	0
80	50	P	P
81	51	Q	Q
82	52	R	R
83	53	S	S
84	54	T	T
85	55	U	U
86	56	V	V
87	57	W	W
88	58	X	X
89	59	Y	Y
90	5A	Z	Z
91	5B	[[
92	5C	\	\
93	5D	ì	j
		-	-

Decimal	Hex	ASCII	Keystrokes*
94	5E	<	<
95	5F	-	_
96	60	1	•
97	61	a	a
98	62	Ъ	Ъ
99	63	C	С
100	64	d	d
101	65	e	e
102	66	f	f
193	67	g	g
104	68	h	h
105	69	i	i
106	6A	j	j
107	6B	k	k
108	6C	1	1
109	6D	m	m
110	6E	n	n
111	6F	0	0
112	70	p	p
113	71	q	q
114	72	r	r
115	73	S	S
116	74	t	t
117	75	u	u
118	76	V	v
119	77	W	W
120	78	X	X
121	79	У	у
122	7A	Z	Z
123	7B	{	{
124	7c		
125	7D	}	}
126	7E	~	~
127	7F	DEL	Ctrl-





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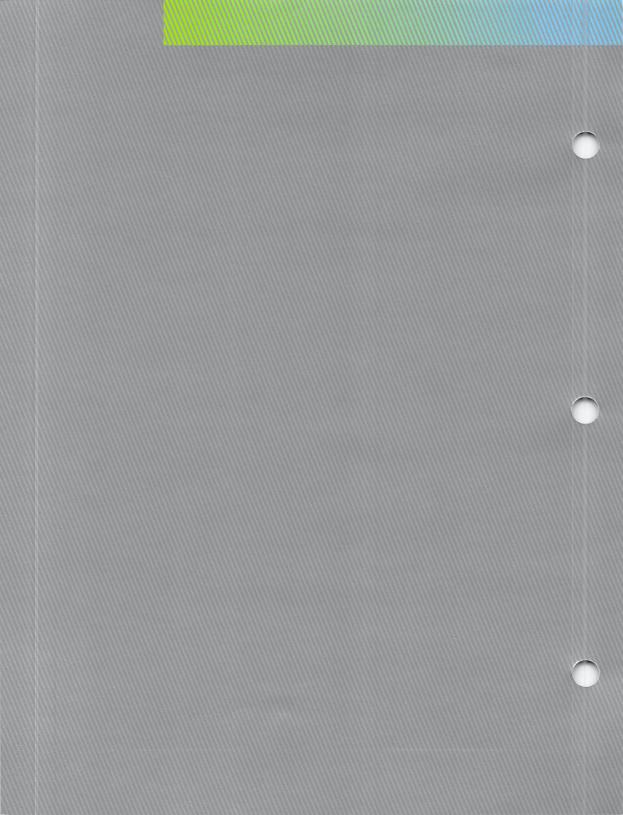
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User Support Information



User Support Information

Hayes Microcomputer Products, Inc. makes every attempt to ensure that you have purchased a product of excellent quality. As with all Hayes products. Smartcom II has been subjected to rigorous testing. This Owner's Manual is as detailed and complete as possible to help you realize the full benefits of the Hayes software product you have purchased. You are encouraged to use the manual as your primary source of reference about the product.

Hayes Customer Service For additional support, Hayes Customer Service personnel are available to assist you from 8:00 AM to 8:00 PM EST Monday through Friday. Our telephone number is (404) 441-1617.

Statement of Copyright Restrictions, Warranty Information and Diskette Replacement Policy These documents are on the following pages. Please take the time to read them carefully.

If your diskette is defective in materials or workmanship, under normal use and during the ninety (90) day warranty period, please follow the instructions in the Warranty Information and Diskette Replacement Policy, Paragraph 1. After the expiration of the Ninety (90) Day Warranty but before the end of the second year after the date of purchase, please follow the instructions in the Warranty Information and Diskette Replacement Policy, Paragraph 4. The current replacement fee is \$20.00 but this fee may change during the two year period that you may obtain a replacement diskette. Contact Hayes Customer Service for diskette upgrade information.

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Any direct, incidental or consequential damages, such as, but not limited to, loss of anticipated profits or benefits, caused by malfunction, defect or otherwise and with respect to breach of any express or implied warranty are not the responsibility of HAYES or anyone else who has been involved in the design, production or delivery of the diskette on which the Program is recorded and, to the extent permitted by law, are hereby excluded both for property and to the extent not unconscionable, personal injury damage. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to Purchaser.

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2. NO WARRANTY OF PERFORMANCE. HAYES makes no warranties, either express or implied, regarding the performance of the Program or the results that may be obtained by using the Program. ACCORDINGLY, THE PROGRAM AND ITS DOCUMENTATION ARE SOLD "AS IS" WITHOUT WARRANTY AS TO THEIR PERFORMANCE. MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. The entire risk as to the results and performance of the Program is assumed by Purchaser. Should the Program prove defective. Purchaser (and not HAYES or any of its dealers) assumes the entire cost of all necessary servicing, repair or correction.

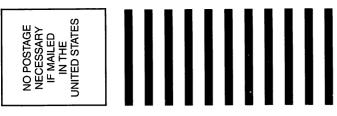
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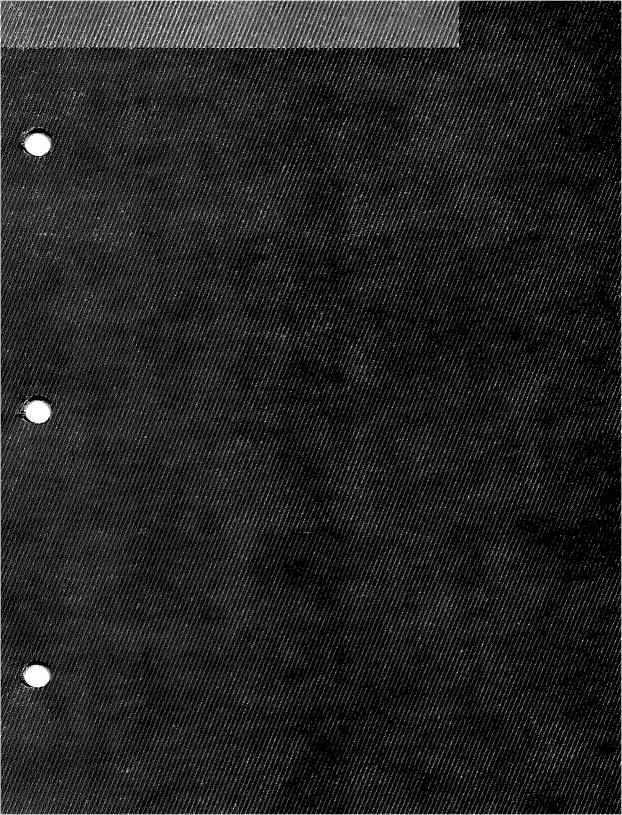
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